GENERAL ELECTRIC
GENERAL ELECTRIC INFORMATION SYSTEMS ITALIA

CRZ 105-111-112-120-121

SEE
PRODUCT
CODE
REFERENCE
4.895.2.500

DESCRIPTION
INSTALLAT.
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PARTS

2

DESCRIPTION

LS 600 CARD READER

(Machine description)

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1. GENERAL

1.1. LEADING PARTICULARS

The LS 600 is a subsystem intended to read, in serial mode, punched cards having either 80 or 51 columns.
The reader may be connected to all Line 100 computers, and to GE computers.
The reader houses in one cabinet the following sub-assemblies:

a) Reader mechanics.

b) Operator panel.

c) Device Oriented Electronics.

d) Controller and Transcoder.

The description of the machine si based on principle of operation basis without going into the more intricate details. Thus, even though the description is basically intended for a 600 card per minute reader, it is also valid for those subsequent models that have a reduced card flow if the intrinsic differences are taken into consideration.

For example:

- The MIS 450 for 400 cards/min is the equivalent of the MIS 420 for 600 cards/min. The drive ratio of the feed head input gear changes.
- The ATA 211 D for 400 cards/min is the equivalent of the ATA 211 for 600 cards/min. The one-shots that regulate card feed sequence, have their times varied; see chap. 857.

Consequently, as a result of the mentioned differences, the mechanical diagrams and electical circuits relative to card feed, the jam circuits and others, have undergone variations that must be identified with the individual model.
The accepted term to define the LS Card Reader is CRZ 111-112 for 400 cards per minute and CRZ 120-121 for 600 card per minute.
The term CRD 160 defines a LS Card Reader connected to the GE 400 Computer system.

1.2. CHARACTERISTICS

The reader functional characteristics may be grouped as follows:

1) - Serial reading with acyclic card feed system that permits a maximum speed of 600 cards a minute.

2) - Photoelectric card reading system achieved with a 12 photodiode read head. Each photodiode is used to read one row of the card.

3) - A 2000 card, continuous replenishment, gravity fed hopper.

4) - A mechanically operated card deflector system to send, when commanded, cards to the reject stacker instead than the normal stacker.

5) - A normal reception stacker with a 2000 card capacity. It may be unloaded during machine operation.
Cards are stacked in the same way and order that they assumed in the hopper.

6) - The reject stacker has a 500 card capacity. May be unloaded during normal machine operation. Cards reach the reject stacker only when a mechanical deviator or deflector is commanded. They are stacked in the same way and order had at the feed hopper.

7) - There is no necessity to separate, flex and joggle the cards prior to loading.

8) - Cards using 51 columns may be utilized after prior adaptation of the feed hopper and stacker.
Commercial invoicing type cards and those cards with perforations for binders may also be used.

9) - The operative console has pushbuttons and luminous indications for the correct utilization of the subsystem.

10) - The subsystem may be employed with a standard controller, with OGE 115 interface, or with an integrated controller connected to an integrated GE 115 channel.
Other controllers which respect the interface may also be used.

11) - The subsystem may use various transcoders, interchangeable between themselves, with the possibility to read either in binary or in mixed mode.

1.3. SYSTEM COMPONENTS

a) - Three phase A.C. power supply, 220 V, 50 cps or 208 V, 60 cps.

b) - Total A.C. power absorbsion. 1.1. KVA approx.

c) - D.C. power supply derived internally.

d) - Total D.C. power absorption. 6 A approx.

e) - LTR 300 Standard employed throughout.

f) - All wiring and cabling abiding to U.L. standards.

g) - Particular LTR 300 circuits will be fully described in the D.O.E. chapter.

h) - Total subsystem weight. 300 Kg.

i) - Dimensions:

- Height - 1200 mm
- Width - 950 mm
- Depth - 700 mm.

l) - Ambient requirements:

- Temperature. From 18° C to 32° C.
- Humidity . From 40% to 60%.

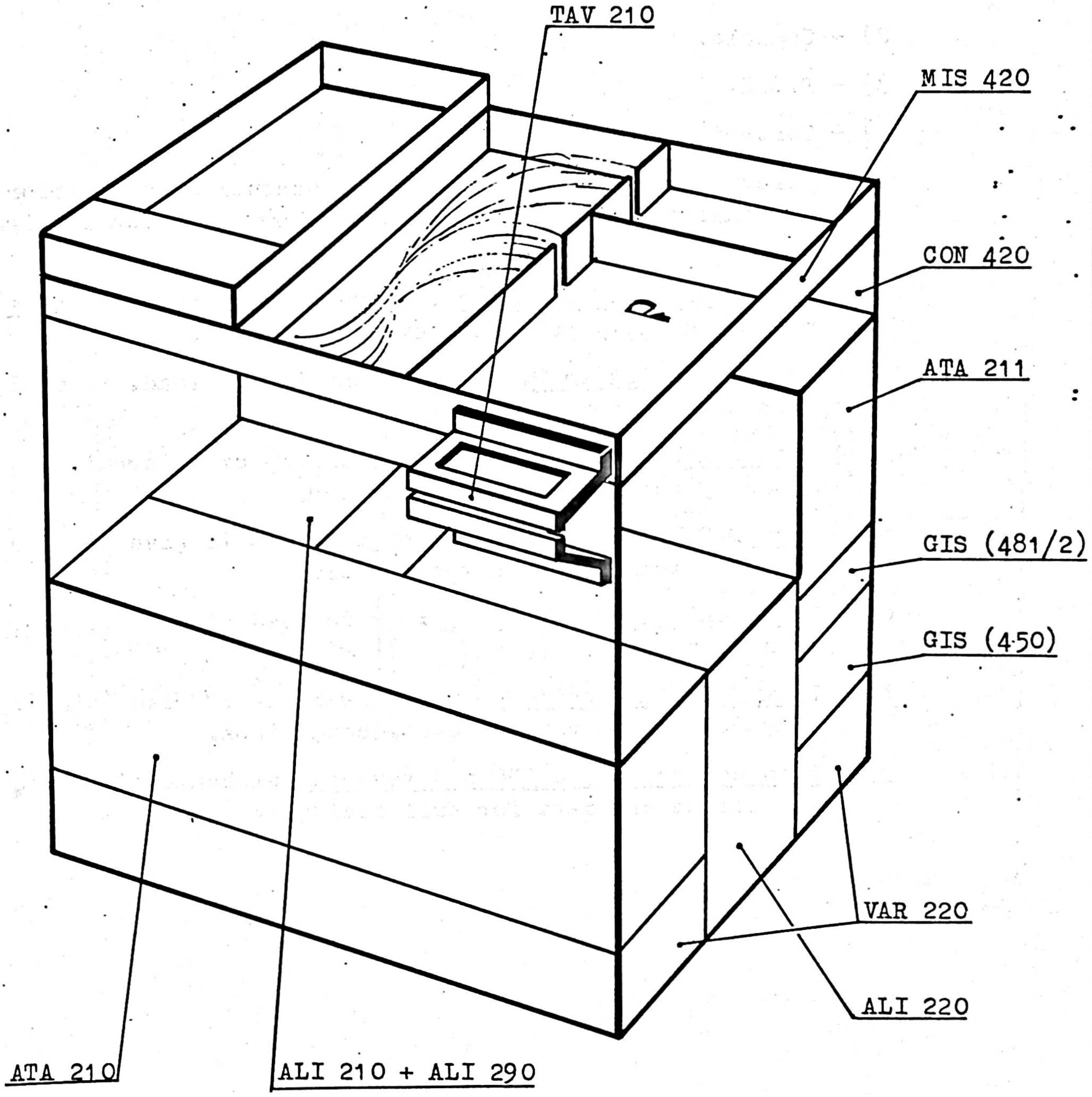
1.4. CONFIGURATION

The elementary units making up the LS 600 are listed below:

1) - CON 420 - Chassis assembly with cabinet.
2) - MIS 420 - Reader mechanics.
3) - ATA 210 - 1st D.O.E. module.
4) - ATA 211 - 2nd D.O.E. module.
5) - TAV 210 - Reader operative console.
6) - ALI 220 - Read lamp power supply.
7) - ALI 210 - Power supply augment.
8) - ALI 290 - Power supply input filters.
9) - GIS 450 - Controller PWB stack.
10) - GIS 481/2 - Transcoder PWB stack.
11) - VAR 220 - Two fan modules.

Topographical location schematized in fig. 1.

Fig. 1 - LS 600 general view



1.5. BASIC BLOCK SUB - DIVISION

All parts that interest the subsystem functioning may be grouped in four blocks:

1) - Mechanics.

2) - Console.

3) - D.O.E.

4) - Controller.

These blocksare tied to each other by executive and informative signal exchanges as described below and shown in fig. 2.

a) - From D.O.E. to Mechanics : signals go to command solenoids and apply power to motors and lamps.

b) - From Mechanics to D.O.E. : forwarding of read, card sync and mechanic state signals.

c) - From console to D.O.E. : forwarding of external commands by console pushbutton action.

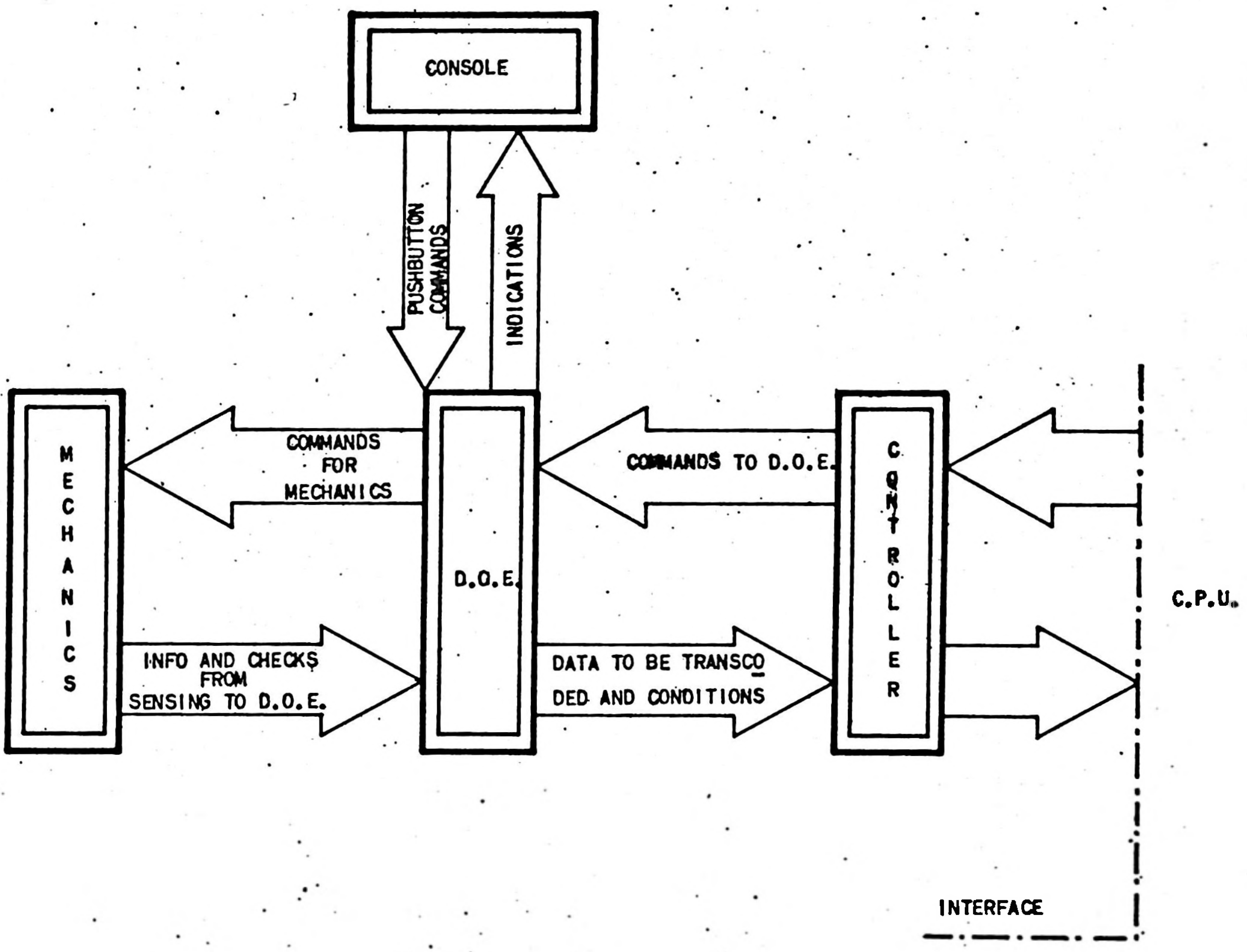
d) - From D.O.E. to Console : signal flow to give rise to luminous indication on the console.

e) - From controller to D.O.E. : go decoded signals provening from the CPU.

f) - From D.O.E. to controller : forwarding of read data for transcoding and various state conditions.

g) - From controller to CPU and reverse: exchange of state conditions and data for full dialogue.

Fig. 2 - Subsystem interactions



2. MECHANICAL OPERATION

2.1. GENERAL

The mechanical portion of the reader is that assembly of organs that correctly interconnected allows for proper functioning of each individual part. Power supply, alignment, read, card drive and stacking mechanism.
All cards have an itinerary to follow which is diagramatically shown in fig. 3.

a) - Drawing of a card from the hopper.

b) - Forwarding of the card, cross wise, to an alignment reference bar.

c) - Advancing the card, lenght wise (serially) to the read track and then eject track.

d) - Card stacking in either the normal stacker or the reject stacker.

The whole machine is subdivided in the following parts.Each will be described in detail later on.

a) - Feed head and hopper.

b) - Read group and timing photodisc.

c) - Read and eject track.

d) - Stackers.

These parts are assembled on a cast aluminium alloy frame that constitutes the machine base (see fig. 4).

Fig. 3 - Principle of operation

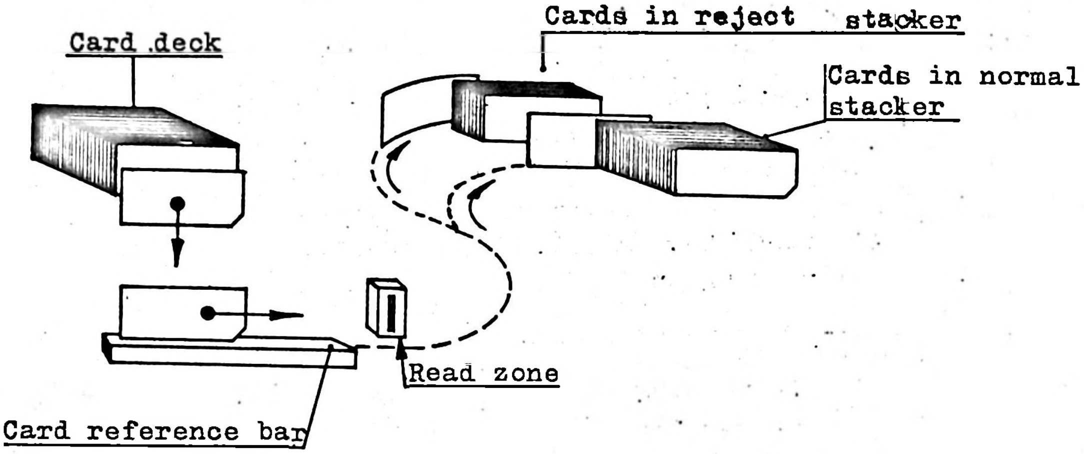
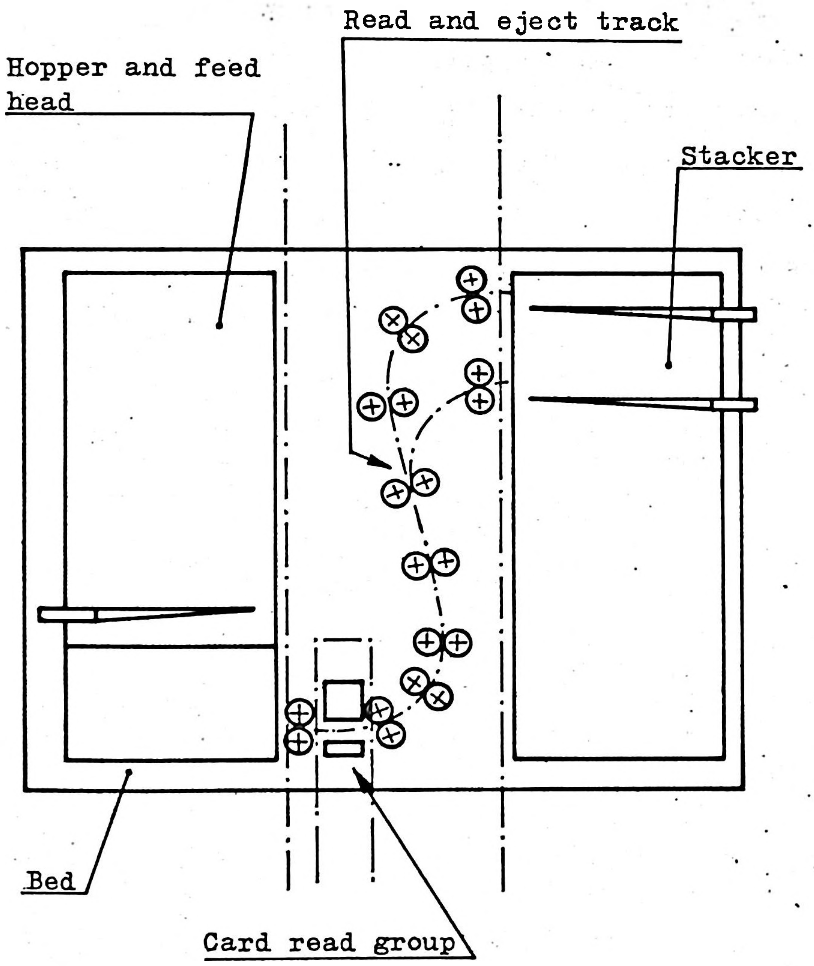


Fig. 4 - Card itinerary



2.2. HOPPER AND FEED ASSEMBLIES

The hopper and feed assembly form a complete block, pinned to the machine bed and secured to the same, by screws. The hopper is located at the rear of the block. Cards, which are gravity fed towards the feed head, are guided at the sides by brackets which are part of the hopper. Other components which are fixed directly to the bed are:

a) - The card alignment reference bar. It closes the waiting station's lower portion and is fixed directly to the machine bed.

b) - The counter rollers support. It completes the sides of the waiting station and makes it accessible to the outside. This support is hinged to the bed and may be opened for servicing.
It is normally hooked onto the R.H.S. of the card feed block.

c) - The feed motor. It is situated on the lower part of the feed block and secured to a flange.

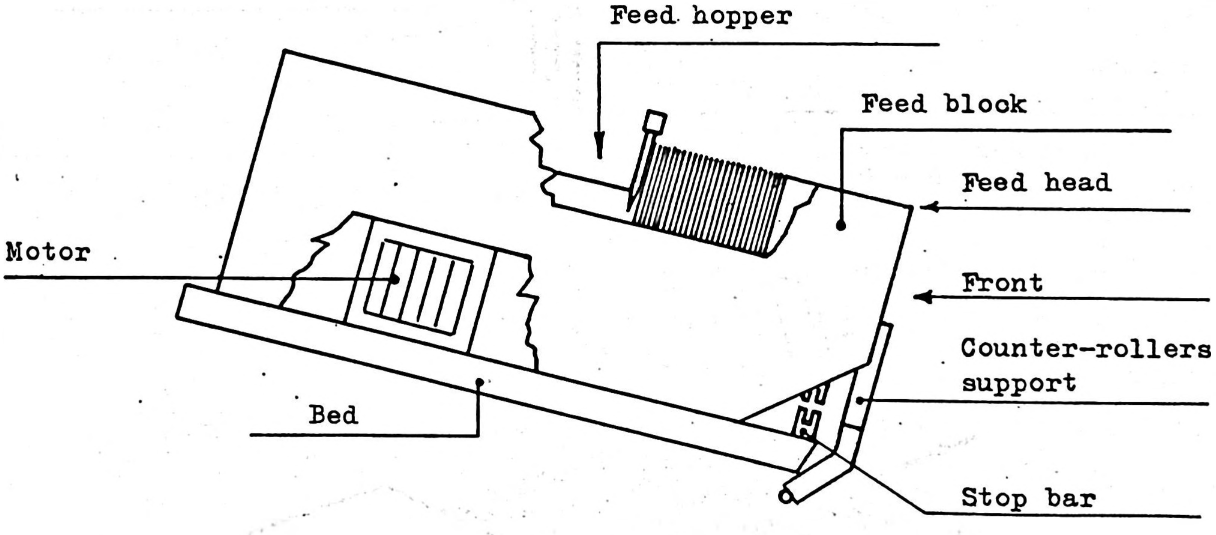


Fig. 5 - General view

2.2.1. Feed hopper

The feed hopper has a 2000 card capacity and may be loaded during normal machine functioning. A card weight gives uniform pressure.
The card to be read is drawn from the deck by two feed belts on which it rests.
A double card feed is prevented by a calibrated width throat.
The feed back-up plate arm is guided and hinged in such a way to ease card loading procedure during machine operation.
It may be also located in the fully open position (see figs. 6 and 7.).

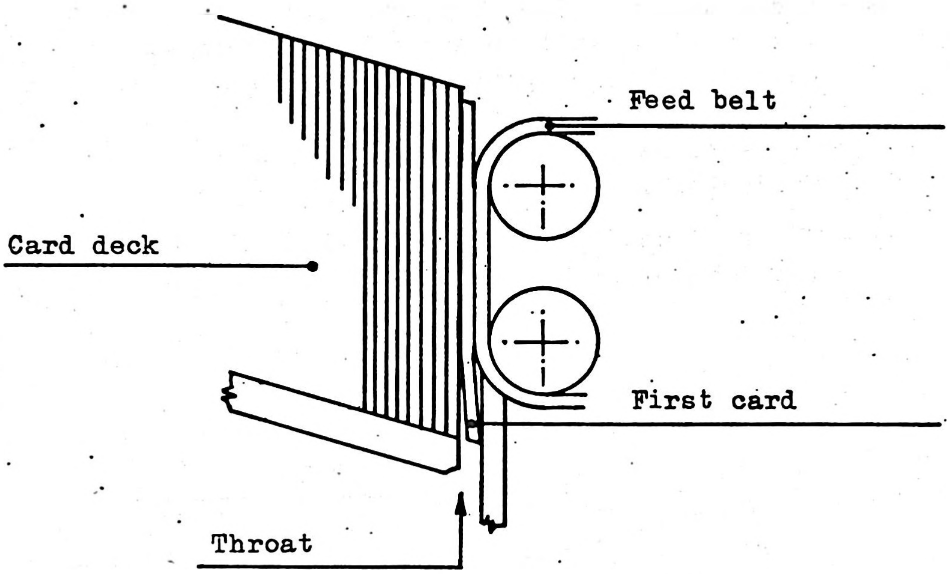


Fig. 6 - Card picking

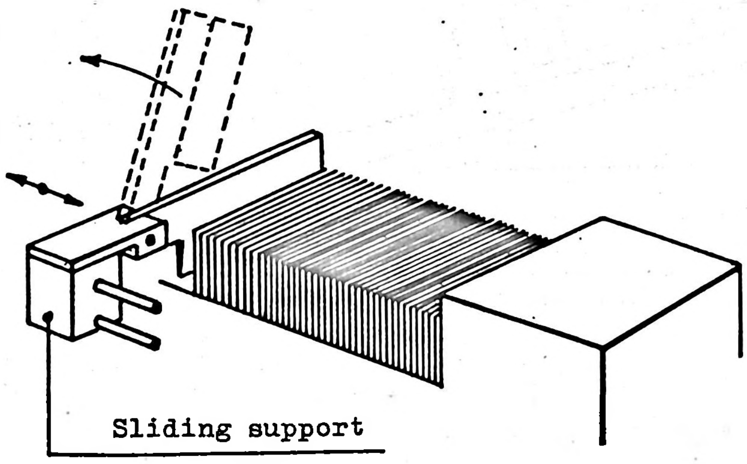


Fig. 7 - Feed backup plate

2.2.2. Feed head

It consists of the mechanisms for card drawing, advance, alignment and ejection from the waiting station.
Fig. 8 schematically illustrates these mecchaninsms. showing the path taken by cards from the feed hopper to the waiting station.

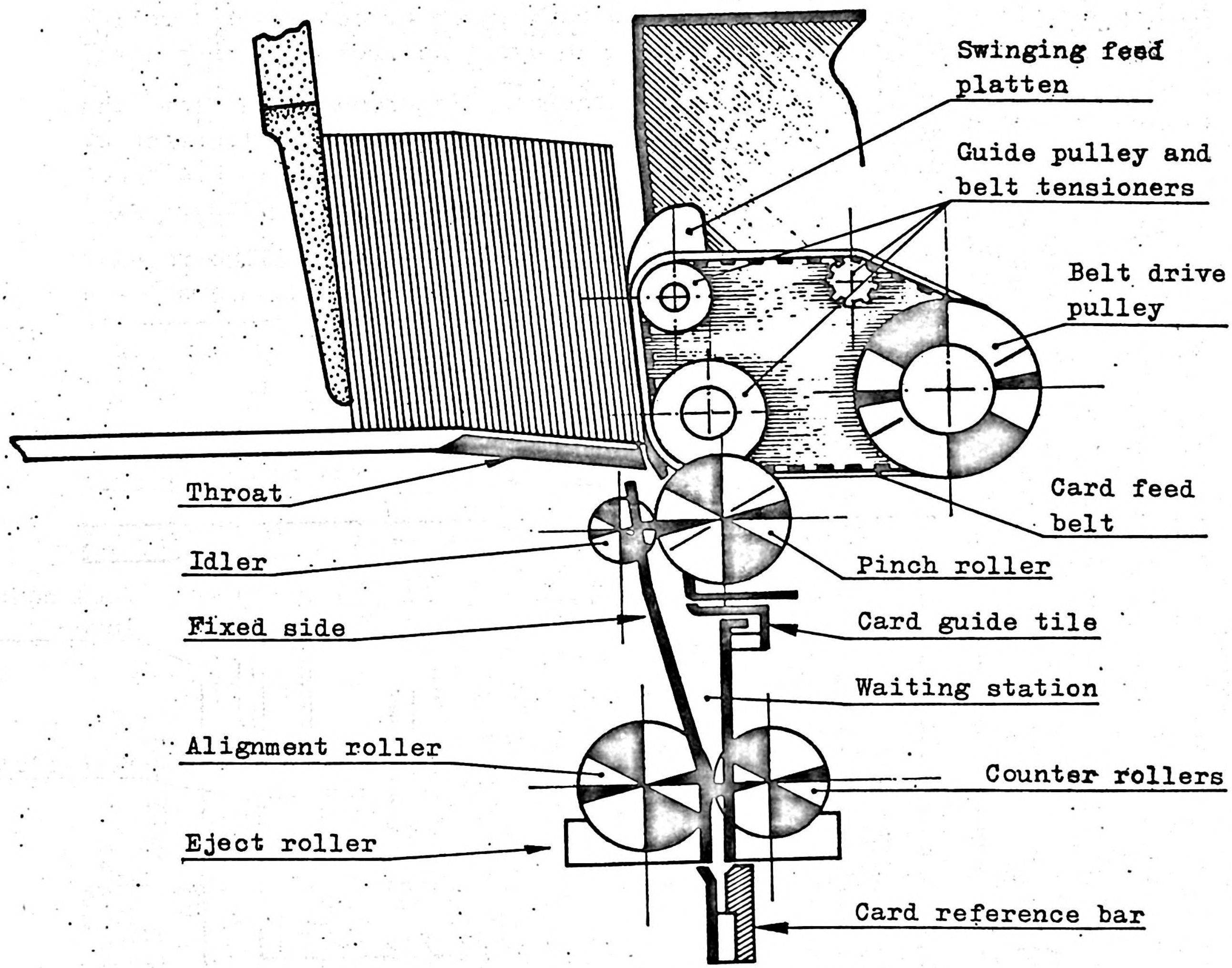


Fig. 8 – Card path

Card feed sequences may be sumrized as follows:

a) - At the receipt of a feed command the two feed belts move,drawing by virtue of their motion, the first card and send it to the throat.

b) - The card them comes in contact with the pinch rollers which drive it to the waiting station.

c) - The card is then taken up by the alignment roller that positions it on to the card reference bar.

d) - With the next feed command, the card in the waiting station is fed to the read track by the eject roller and, simultaneously, the cycle as from a) is repeated.

c) - The speed with which the card is transferred from the hopper to the waiting station is less than 1.5 m/secs. Card eject speed from the waiting station is 4.4 m/s. This velocity is kept throughout the card itinerary.

The whole assembly making up the feed head is illustrated in figs. 9,10 and 11 and the various component parts are examined and described separately.

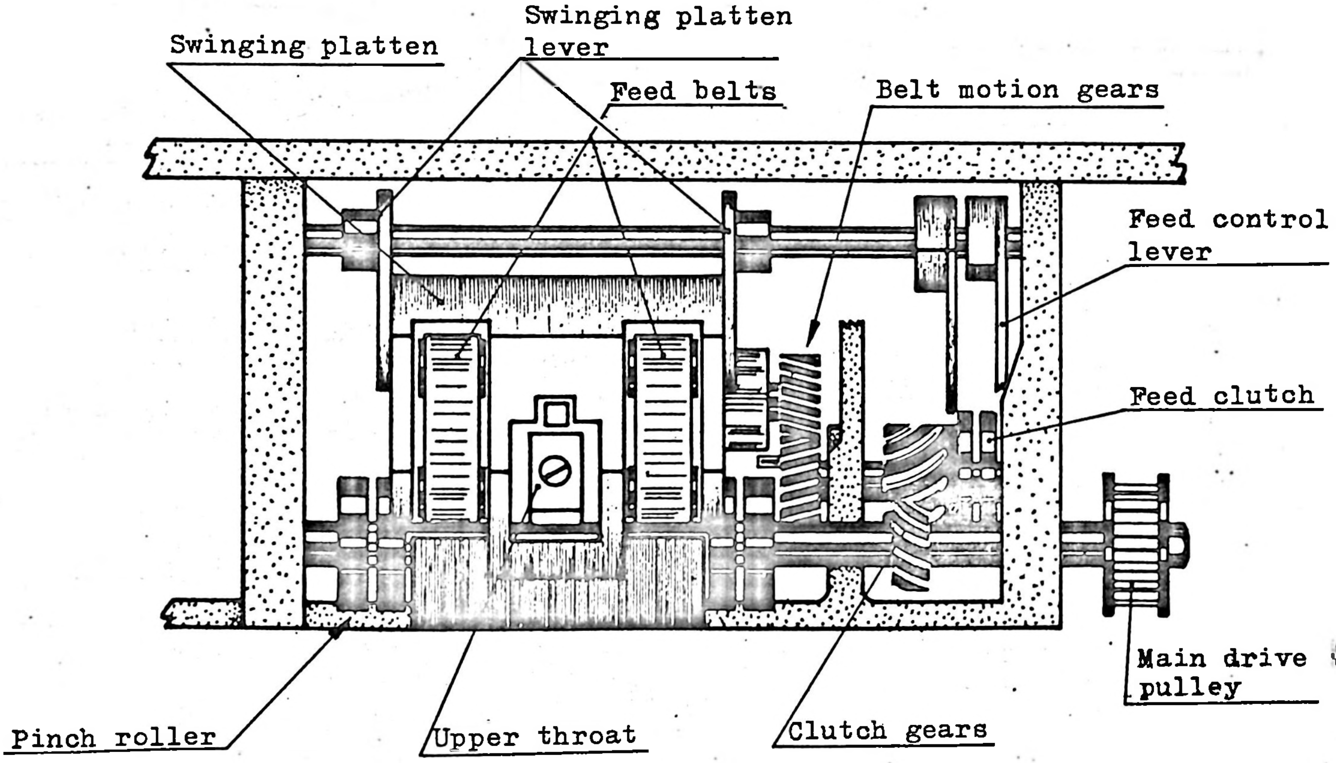


Fig. 9 - Frontal view

Fig. 10 - Feed head lower view

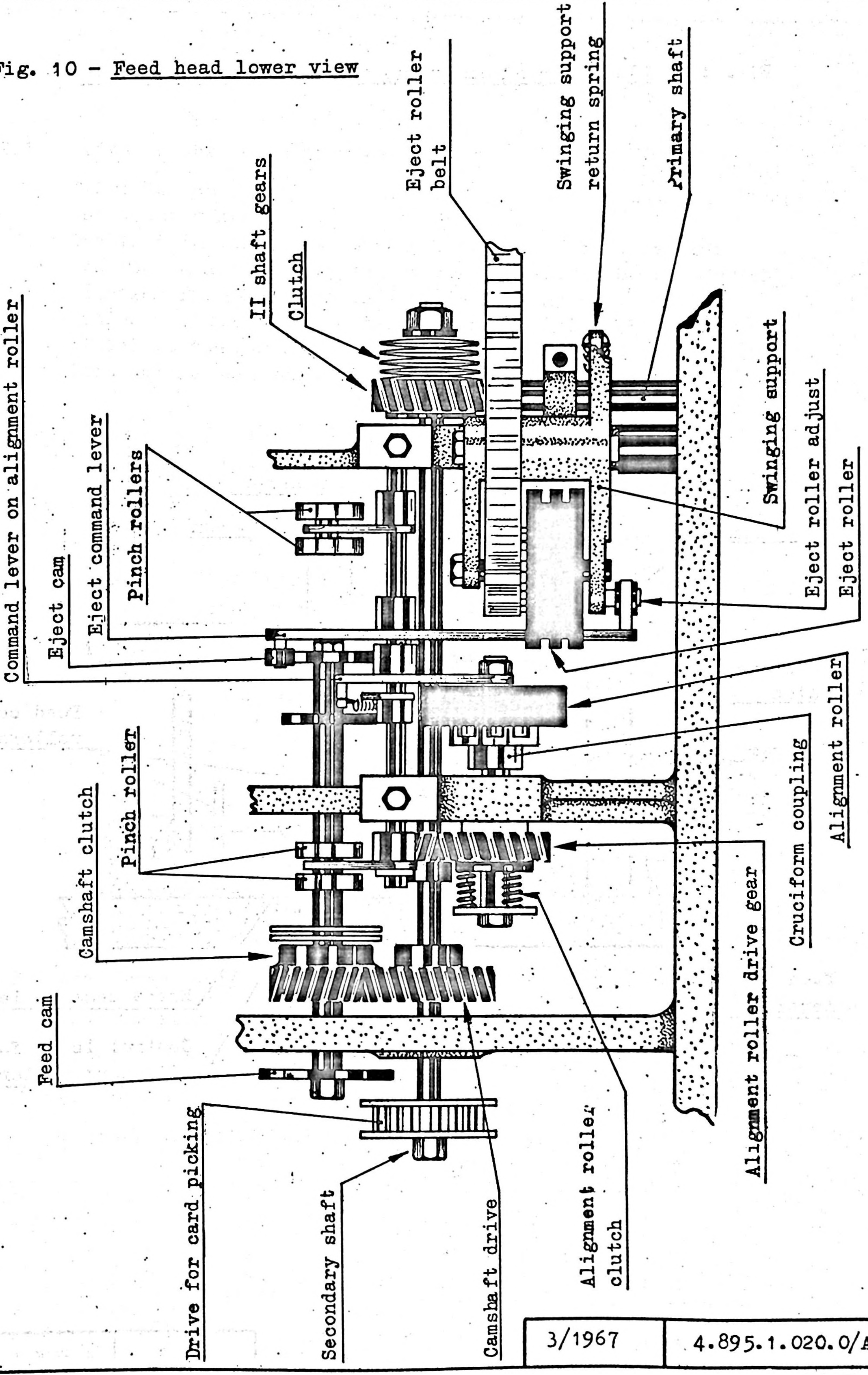
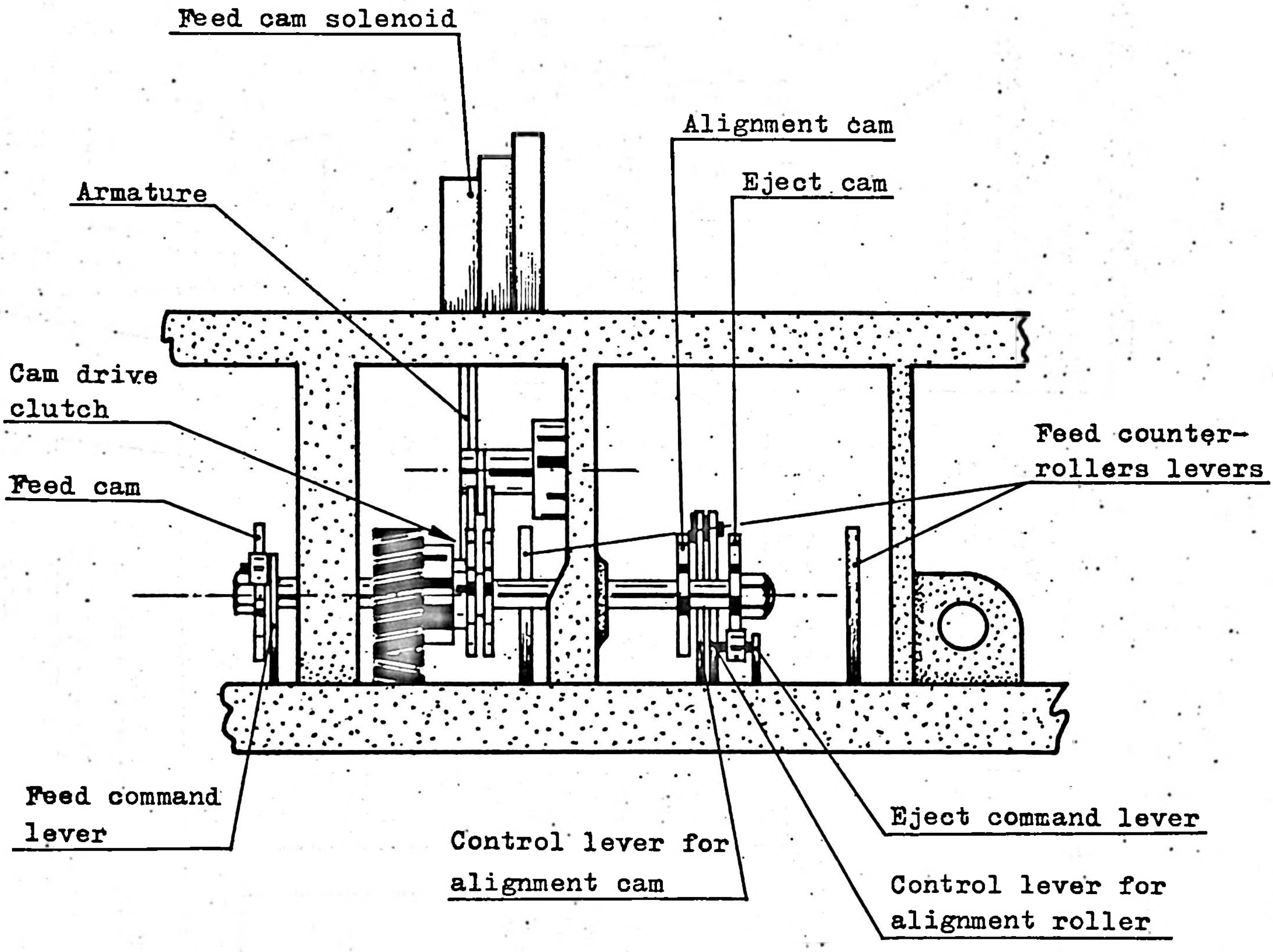


Fig. 11 - Plan view of cam group and feed command solenoid



2.2.2.1 Drive to the secondary shaft

Drive to the secondary shaft is disc friction driven from the primary shaft.
The friction drive is to ensure that no damage is caused to the feed head assembly in the eventuality of seizure or malfunction fig. 12 shows the complete group.
Motion derived from the main (primary) drive shaft is transmitted to the worm gear, the helical gear, the disc clutch then to the secondary shaft.

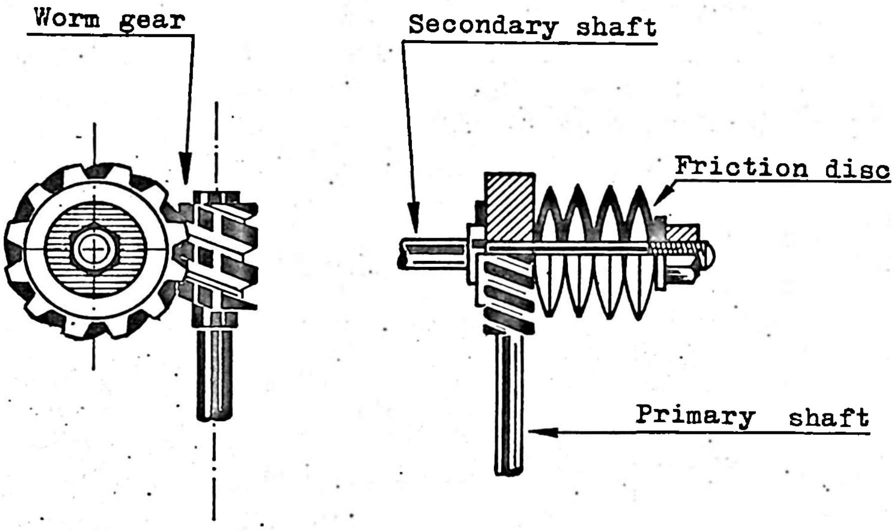


Fig. 12 - Worm gear and friction drive to secondary shaft

2.2.2.2 Secondary shaft

The secondary shaft imparts motion to the:

a) - alignment roller (gear)

b) - cam clutch (gear)

c) - pinch rollers shaft (belt)

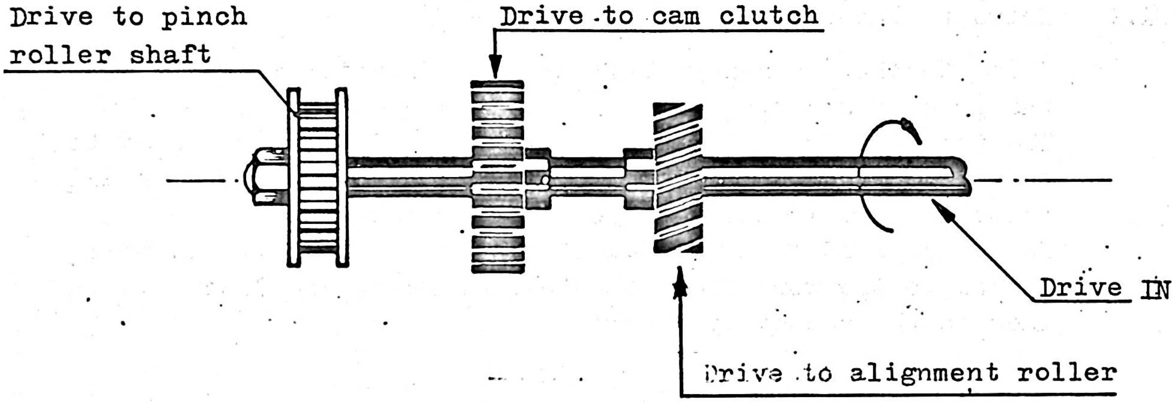


Fig. 13 - Secondary shaft

2.2.2.3 Pinch roller shaft

Fig. 14 shows how the drive for the pinch roller shaft is derived.

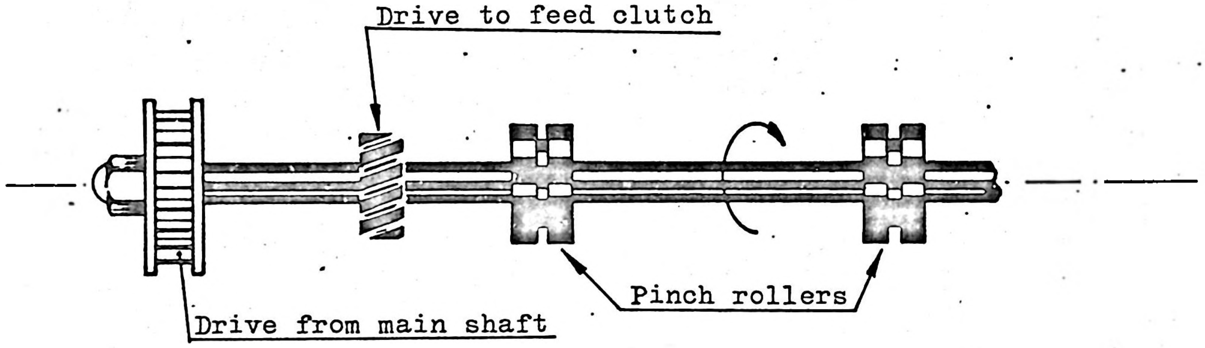


Fig. 14 - Pinch roller shaft

2.2.2.4 Cam clutch

At every command, the cam clutch causes a rotation of 360° to the cam shaft causing a complete card feed cycle i.e. A card is drawn from the hopper and fed to the waiting station. Simultaneously the card present in the waiting station is forwarded to the read station.

The clutch is of the asynchronous type and receives direct drive from the secondary shaft through gears.
Fig. 15 gives a cut-away view of the camshaft clutch. This assembly may be split in the following main parts:

a) - A constantly rotating geared shell directly connected to the secondary shaft from which it receives its drive. When the clutch is disengaged, the rollers bind on the shell internal surface.

b) - A cage and hooking cam. These are joined together with the cage acting directly onto the rollers which are shrunk inside it. The hooking cam causes the clutch to come to a stop when it impinges onto the pawl.

c) - A hexagonal core and a hooking counter cam. They are fixed together and onto the camshaft itself. The hexagonal core causes the rollers to bind on the shell's internal surface. The counter arm prevents the clutch from backing-up at stop.

d) - Drive rollers. The 6 rollers placed within the shell constitute a rigid driving body between the shell and the hexagon, at the moment when the clutch begins to bind.

e) - A circlip type spring. With the clutch disengaged, it allows the cage predetermined angular motion with respect to the hexagonal core.
This action keeps the rollers in direct contact with the core and their pressure is only released when the clutch hooks on the pawl and associated hook.

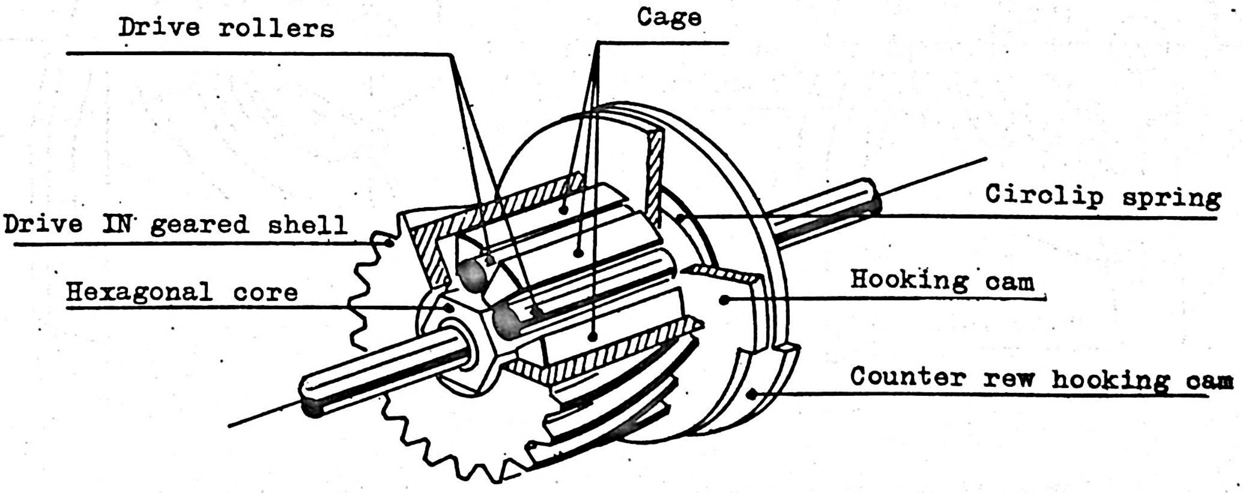


Fig. 15 - Camshaft clutch

Figs. 16 and 17 show the two phases of functioning. To further clarify the camshaft clutch operation, the following points will be considered:

a) - When the clutch is engaged, the position between the cage and the hexagonal core is such to allow freedon to the rollers.
This, therefore, leaves the outer shell to rotate freely.

b) - As the stop pawl is released, the cage rotates for the given quantity allowed by the circlip spring and brings the rollers to bear on the flats of the hexagonal core. The clutch starts to rotate.

c) - When the clutch is engaged, the hooking cam, onto which the cage is connected butts up against the pawl stopping.
The inertia of the system is such to cause the circlip spring to become stressed, to rotate the hexagonal core and allow the hooking cam to fall in the counter-march nick.
The whole system, therefore returns to the condition described in point 1 above.

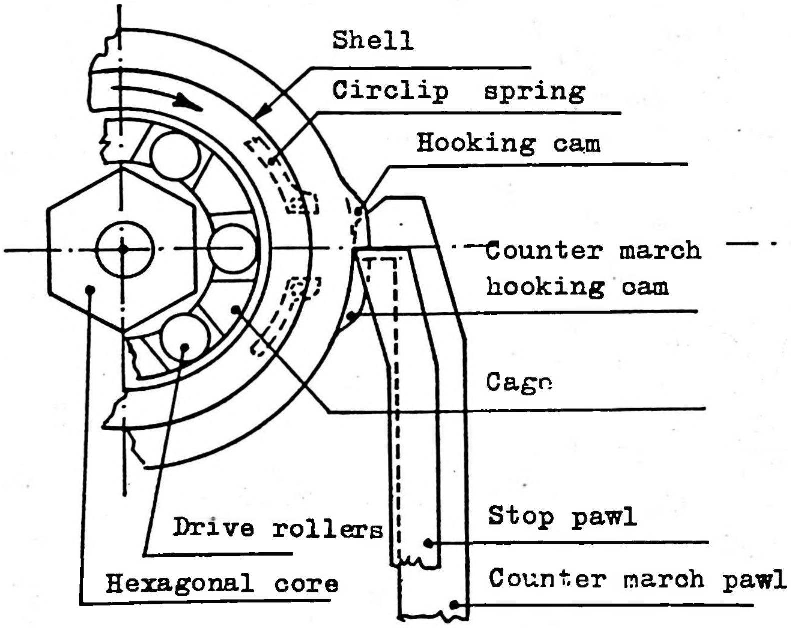


Fig. 16 - Clutch engaged

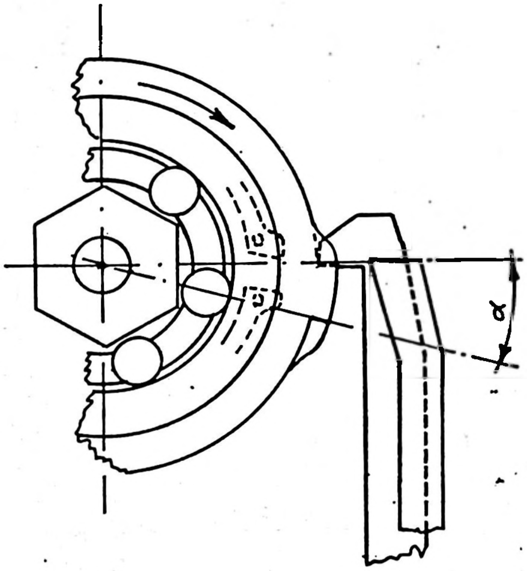


Fig. 17 - Clutch disengaged

The clutch is commanded electrically through a solenoid connected to the stop pawl.
Fig. 18 shows the operation of the solenoid and the shock absorbing system.

2.2.2.5 Camshaft

Fig. 19 shows the general disposition of the camshaft. It receives drive through the cam clutch and has 3 cams keyed on it.

1) - Feed cam - This cam moves the levers belonging to the card picking system.

2) - Alignment cam - This cam moves the alignment roller levers.

3) - Eject cam - This cam moves the eject (high speed) roller lever.

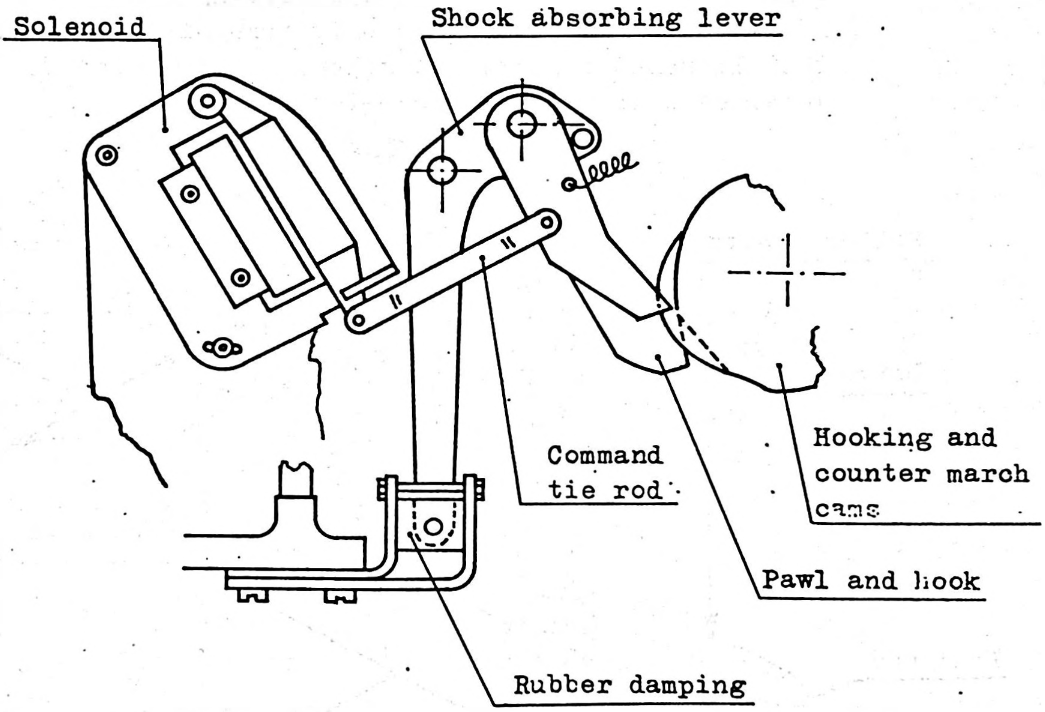


Fig. 18 - Camshaft clutch control

2.2.2.6 Alignment rollers clutch and cruciform coupling.

The secondary shaft, through a pair of gears, a felt interposer and a cruciform coupling, imparts movement to the alignment roller. The felt pad interposer, acting as a clutch, causes the alignment roller to came to rest when the card touches the reference bar.

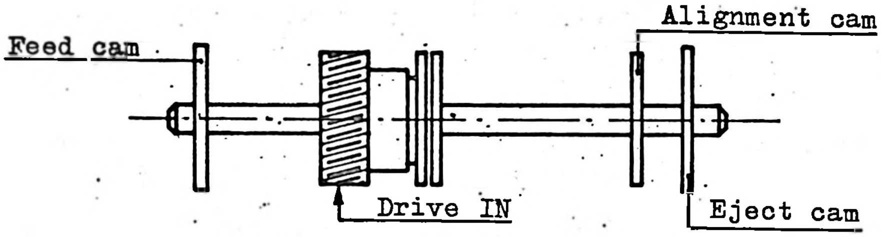


Fig. 19 - Cam shaft

The felt pad interposer also establishes the value of the force exerted by alignment roller on the card for all the time that it is present in the waiting station.
The cruciform coupling not only transmits its rotation to the alignment roller, but allows any transversal movement imparted onto it by the cam-lever system.

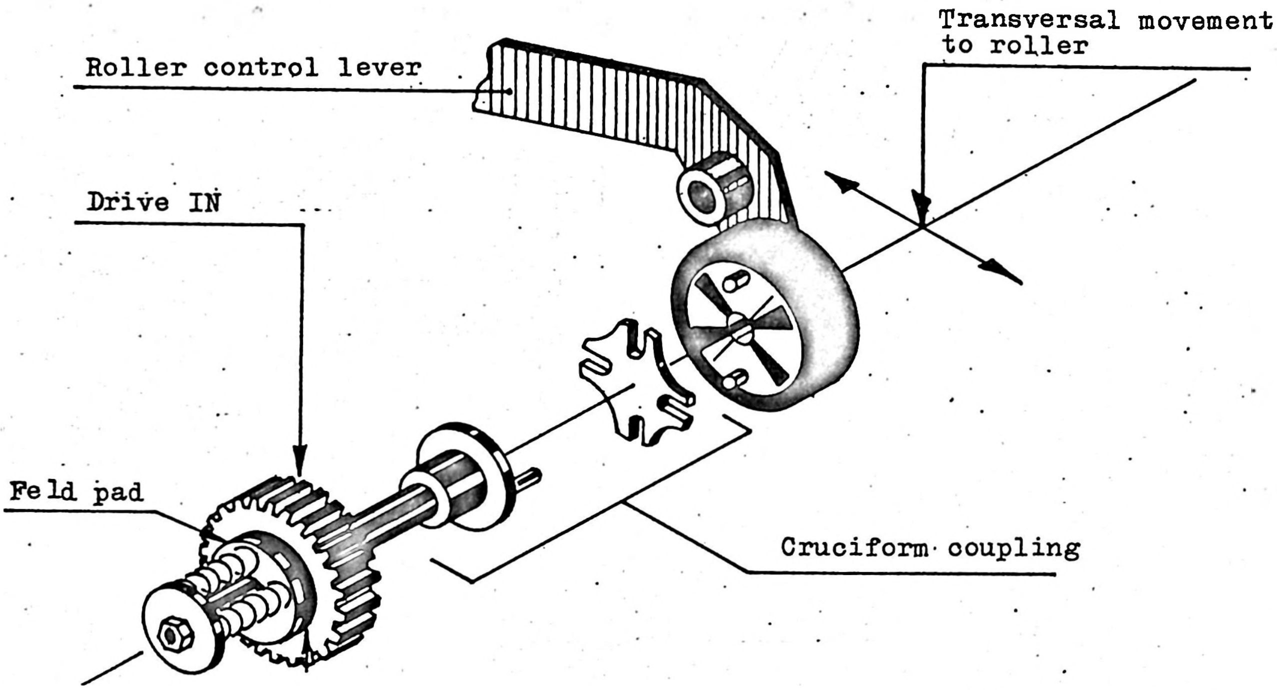


Fig. 20 - Drive to alignment roller

2.2.2.7 Alignment roller

The alignment roller may move to and for transversally to position the card in the waiting station when it is in contact with its idler.
When it with draws it allows the card to be ejected from the waiting station.
This to and from movement is obtained with a cam-lever system.
This oscillation is repeated at every feed cycle at every feed cycle at a time determined by the cam positioning on its shaft.

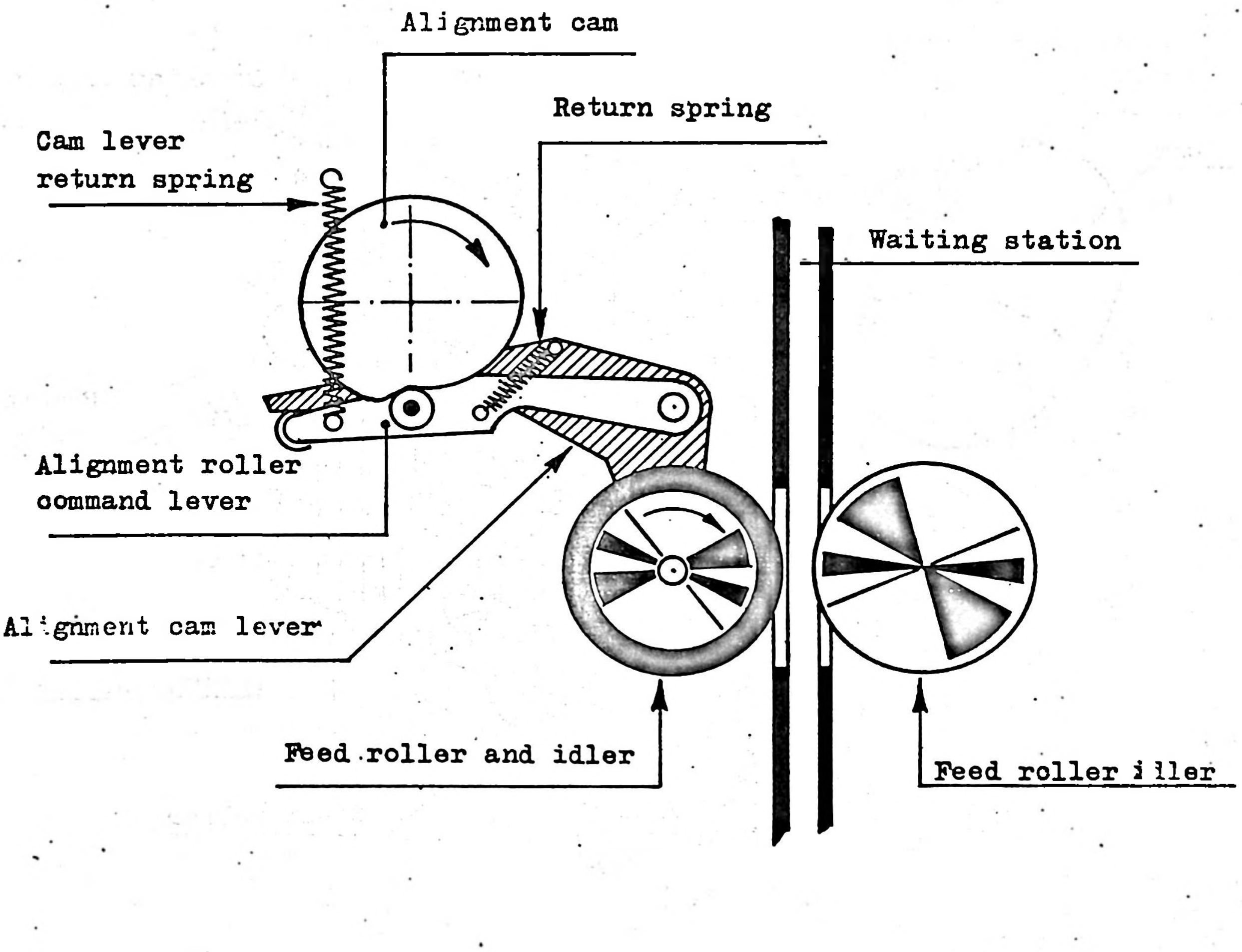


Fig. 21 - Alignment roller mechanism

Fig. 21 shows that with the roller positioned in the cam's lower profile, the alignment roller has withdrawn from the plane of the waiting station.
When, on the other hand, the roller rides high on the cam, the roller is brought in contact with its idler adhering with a pressure established by the return spring.

2.2.2.8 Eject roller

The high speed eject roller is maintained in continuous rotation through a toothed belt driven from the shaft of the first pair of track rollers.

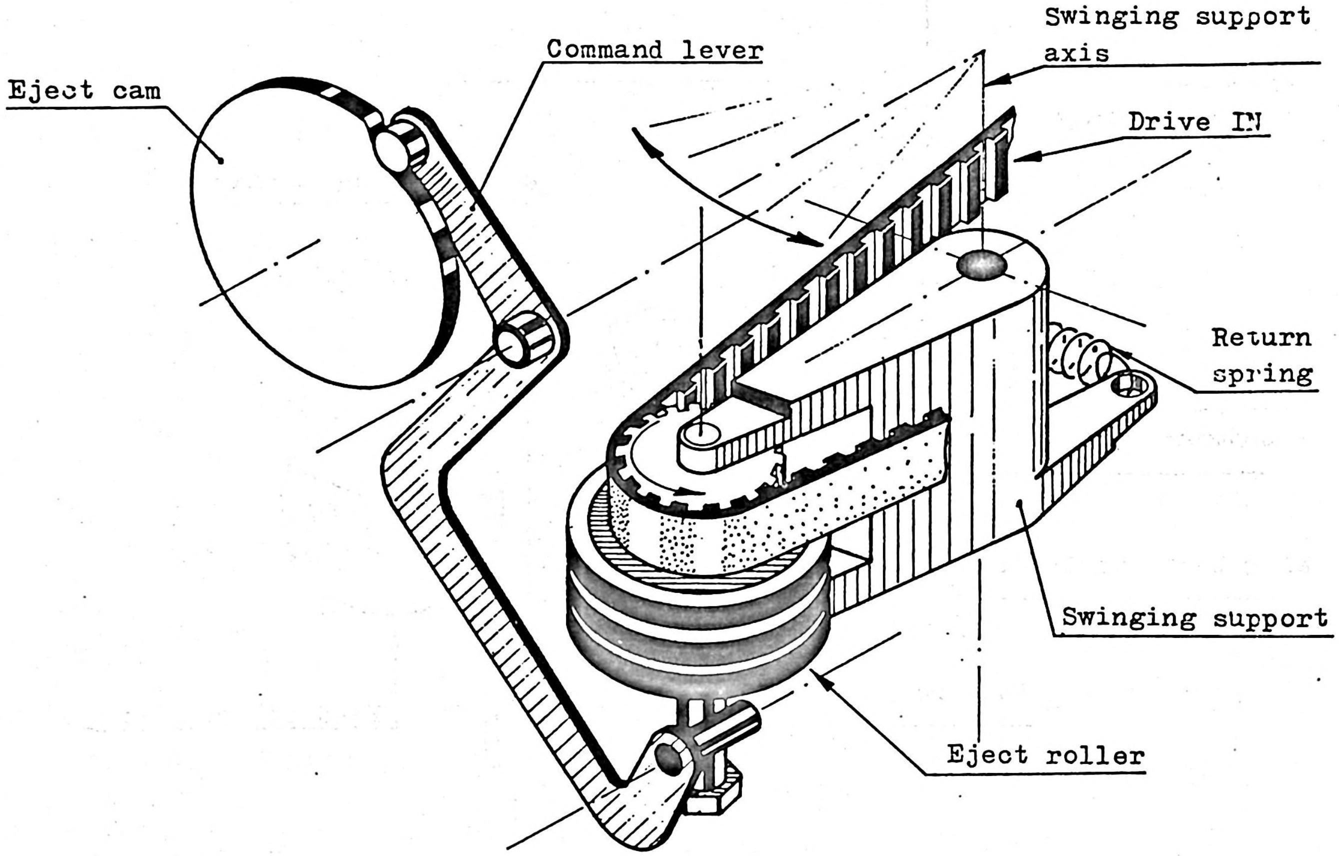


Fig. 22 - Eject roller mechanism

The eject roller is designed to have an oscillating movement commanded by a cam-lever system. This cyclic movement is achieved by a cam acting on a roller.
When a card is to be ejected from the waiting station the eject roller touches its idler.
When the cam profile removes the pressure from the command lever, the eject roller withdraws from its idler allowing a new card to be introduced in the waiting station.

2.2.2.9 Swinging platten

The swinging platten is located in the card feed assembly and fulfils the following tasks:

1) - Under machine OFF conditions the platten is withdrawn. The card deck is therefore in contact with the feed belts. Friction between the card and the belts prevents the card from falling into the waiting station below.

2) - At the start of evey mechanical cycle the platten remains withdrawn.
The feed belts drag the first card downwards, under the pinch rollers.

3) - As soon as the card finds itself under the pinch rollers, the platten advances further than the plane of the moving feed belts.
This prevents the feed belts picking another card, causing an inevitable throat jam.

4) - Before the end of the end of the mechanical cycle and after the feed belts have came to a stop, the swinging platten withdraws once more.

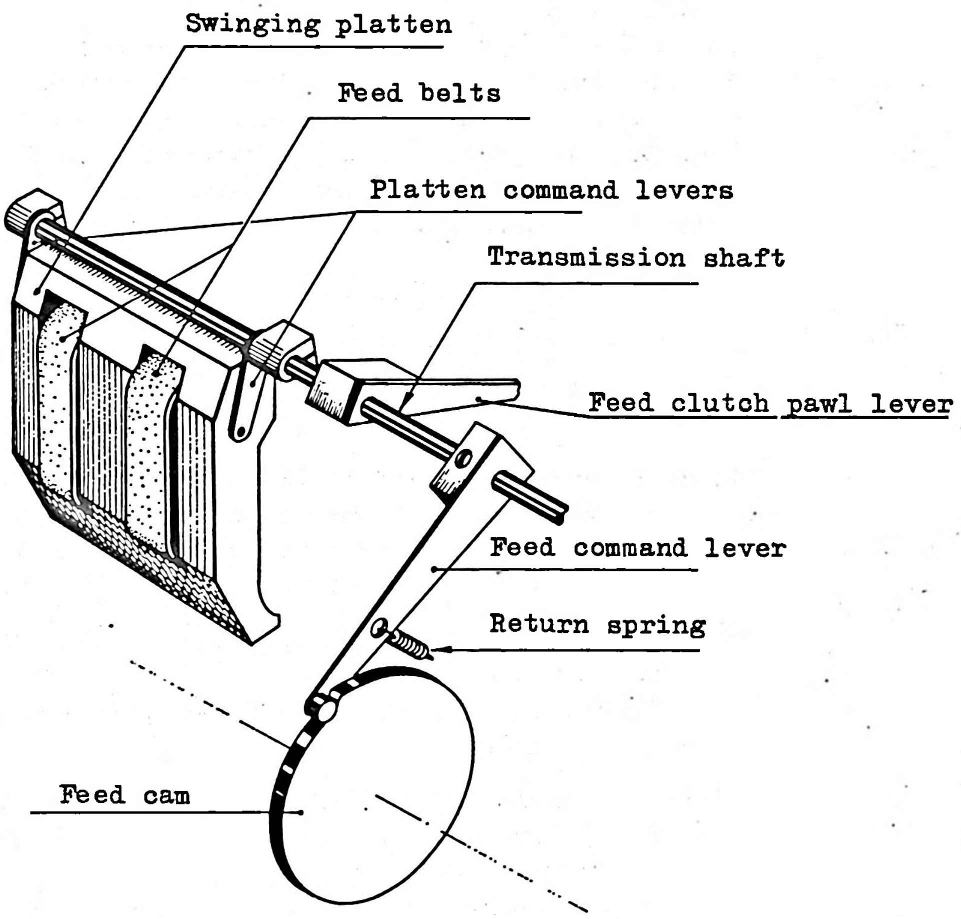


Fig. 23 - Swinging platten mechanism

The rotation of the feed cam causes an oscillating movement to the swinging platten. Motion is transmitted a lever-roller system. The cycle is restored by a return spring. This movement is achieved through a cam-lever arrangement that acts directly on the feed command lever and the feed clutch pawl lever which will be described later.

2.2.2.10 Feed clutch

The feed clutch transmits to the card feed belts an alternate rotational drive that, matched to the movement of the swinging platten, effects the picking of one card.

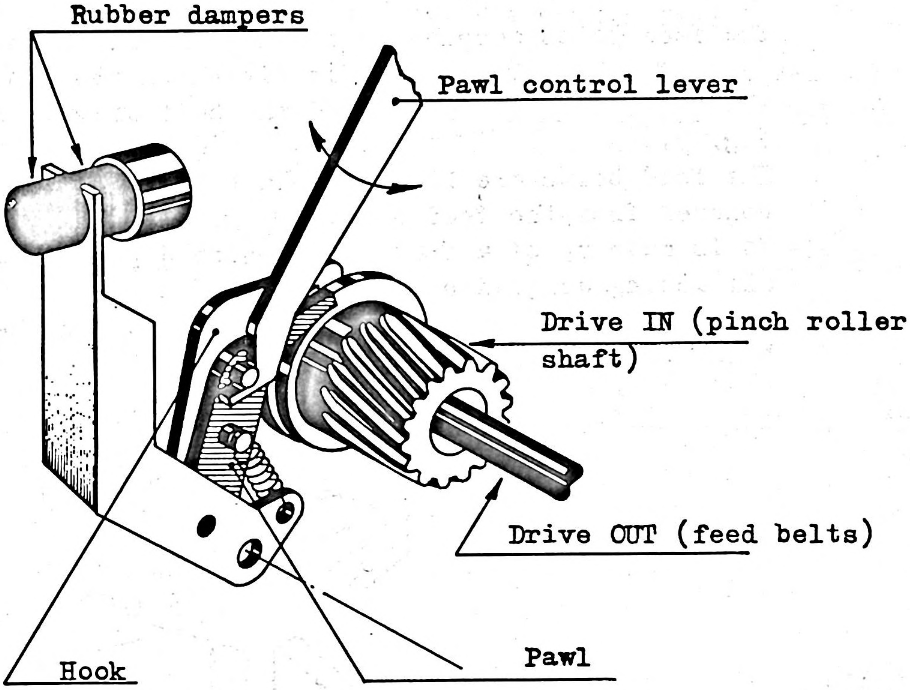


Fig. 24 - Feed clutch assembly

Its construction and operation is similar to that of the camshaft clutch described previously. See para. 2.2.2.4.
The only difference is the positioning of the hooking cam and the counter march hooking cam.
The camshaft clutch has a rotation of 360° for the feed clutch of 180°, for each command.
Clutch commands come through the pawl control lever which is moved by the feed cam. See fig. 23.

The whole operation is illustrated by fig. 24. Worthy of notice are:

1) - The damping lever - it absorbs the stop impact.

2) - The pawl lift system - lifted by the control lever.

2.2.2.11 Feed belts

The feed belts receive traction from the clutch through a pair of gears. The driver is fitted on the clutch shaft, and the driven is on the axis of the belt driving pulley. See fig. 9.
The feed belts are located in a block that may be readily removed from the feed head.
It is made up of a frame upon which 4 pulleys are fitted, all acting as guides for each belt.
Two are used to maintain the belts taut and the other two being the drivers.

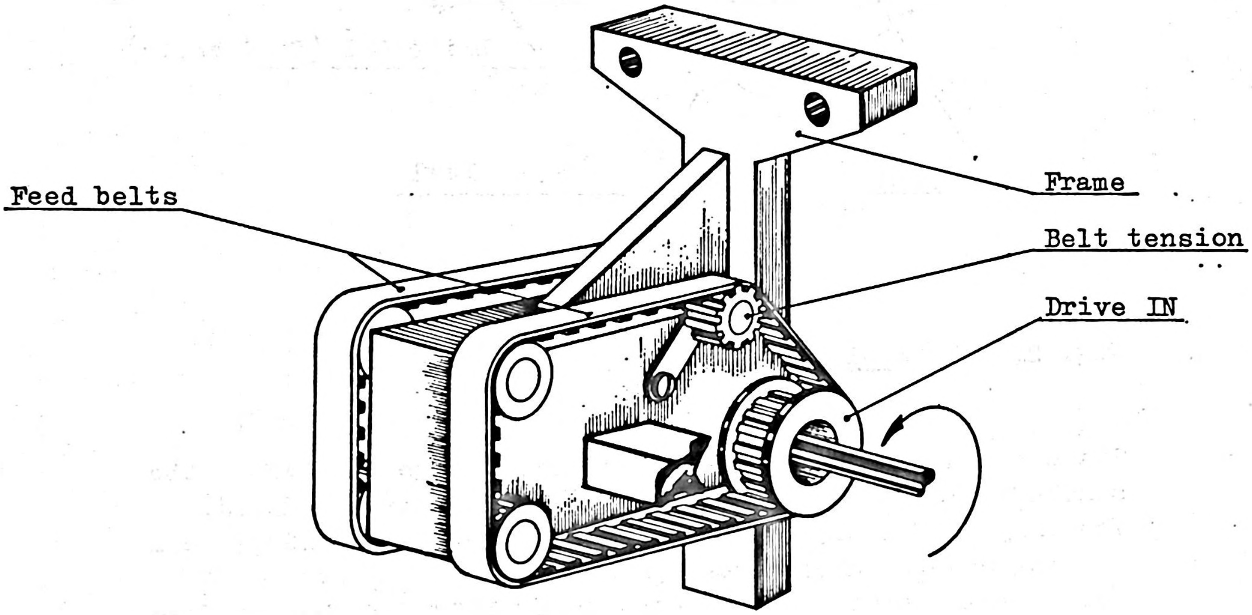


Fig. 25 - Removable feed belt block

2.2.2.12 Throat

The throat consists of a vertical knife fitted on the feed belt frame and a horizontal knife on the feed head support casting.
Only the horizontal knife is adjustable to set the throat gap.
Its function is to allow the passage on only one card at the time avoiding all possibility of a double feed.

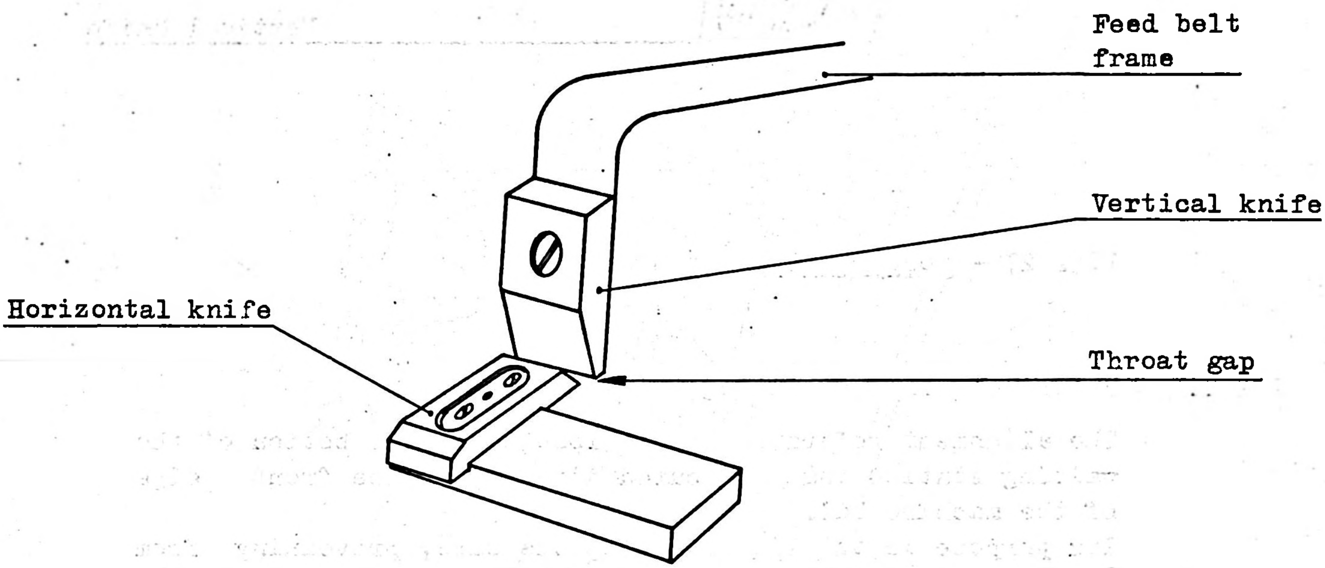


Fig. 26 - Throat group.

2.2.2.13 Hopper microswitch

It is fitted to a support and operated by a V shaped command lever. One leg of the V carries a roller that protrudes toward the front of the card picking unit, exactly between the two feed belts.
When no cards are present in the hopper the microswitch trips.

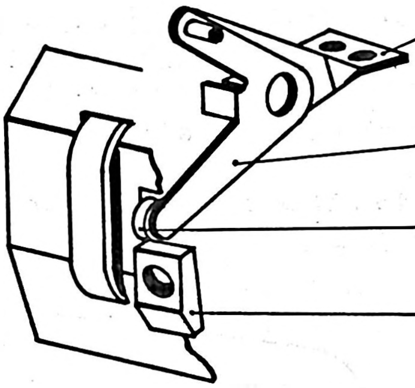


Fig. 27 - Hopper microswitch

2.2.2.14 Reference bar and waiting station

The alignment reference bar is located at the botton of the waiting station and is secured directly on the front edge of the machine bed.
Its purpose is to align and stop the card, proveining from the hopper, so to present it perfectly squared-up to the read head.
The waiting station consist of:

a) - A hinged plate upon which various devices are fitted. This plate, or swinging wall, hooks on the fixed side of the waiting station which is integral with the feed head.

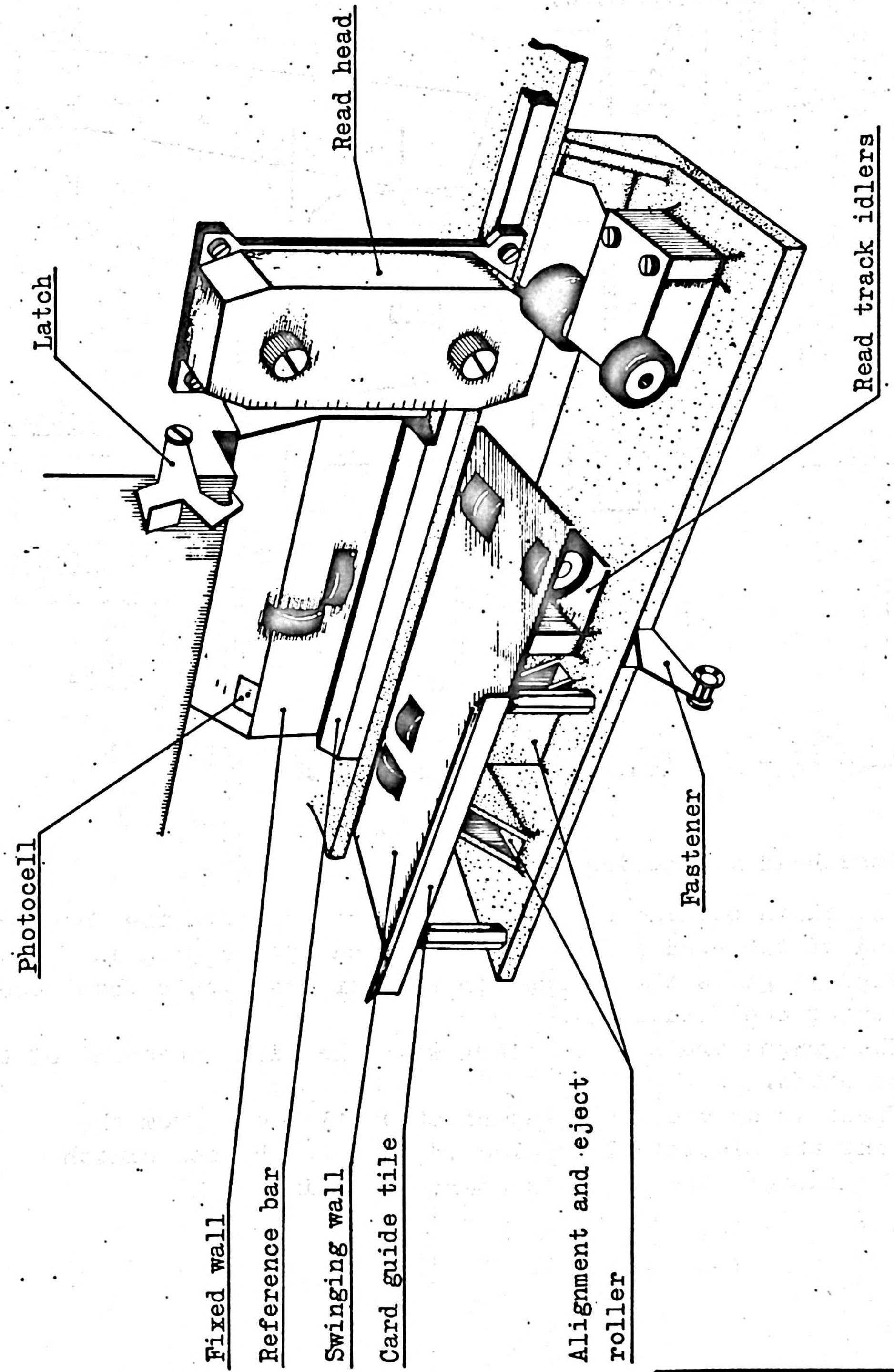
b) - The alignment and eject idlers.

c) - The read track idlers.

d) - The card guide tile that completes the waiting station upper part.

The general layout of all the component parts is shown in fig. 28.

Fig. 28 - Waiting station - open



Furthermore, fig. 29 shows the waiting station swinging wall interlock microswitch and the photodiode lamp.
The microswitch is so wired to prevent machine switch - on with the waiting station open.
The lamp, mounted on the photodiode axis, detects the presence or not of a card.

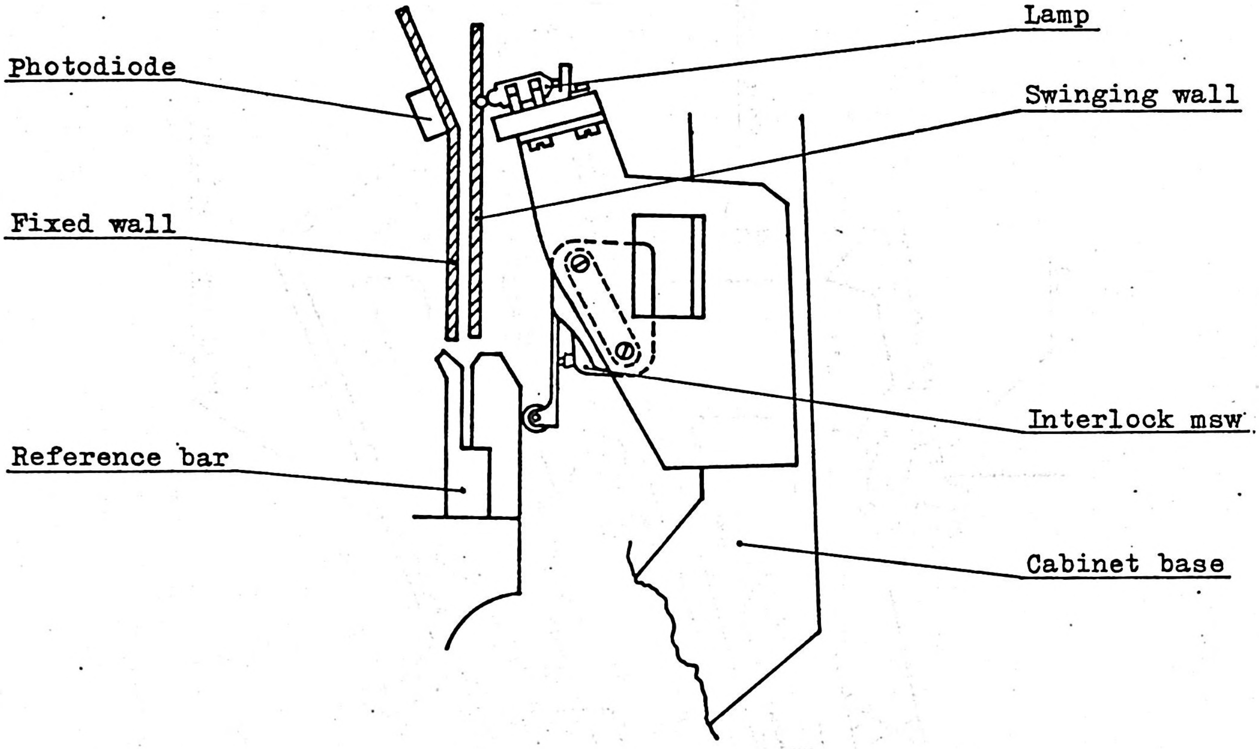


Fig. 29 - Waiting station msw and lamp

2.2.2.15 Feed head kinematics

The chain of kinematic motion transmission to the feed head and of the head itself is schematically analysed in fig.30.
Fig. 31 gives the timing for the various events that occur during one feed cycle.
The graphs are made to start with the first movement of the camshaft.
There is an average delay of about 13 msecs from the moment the electrical impulse is sent to the cam clutch to the instant the camshaft starts rotating.

Fig. 30 - Feed head kinematics

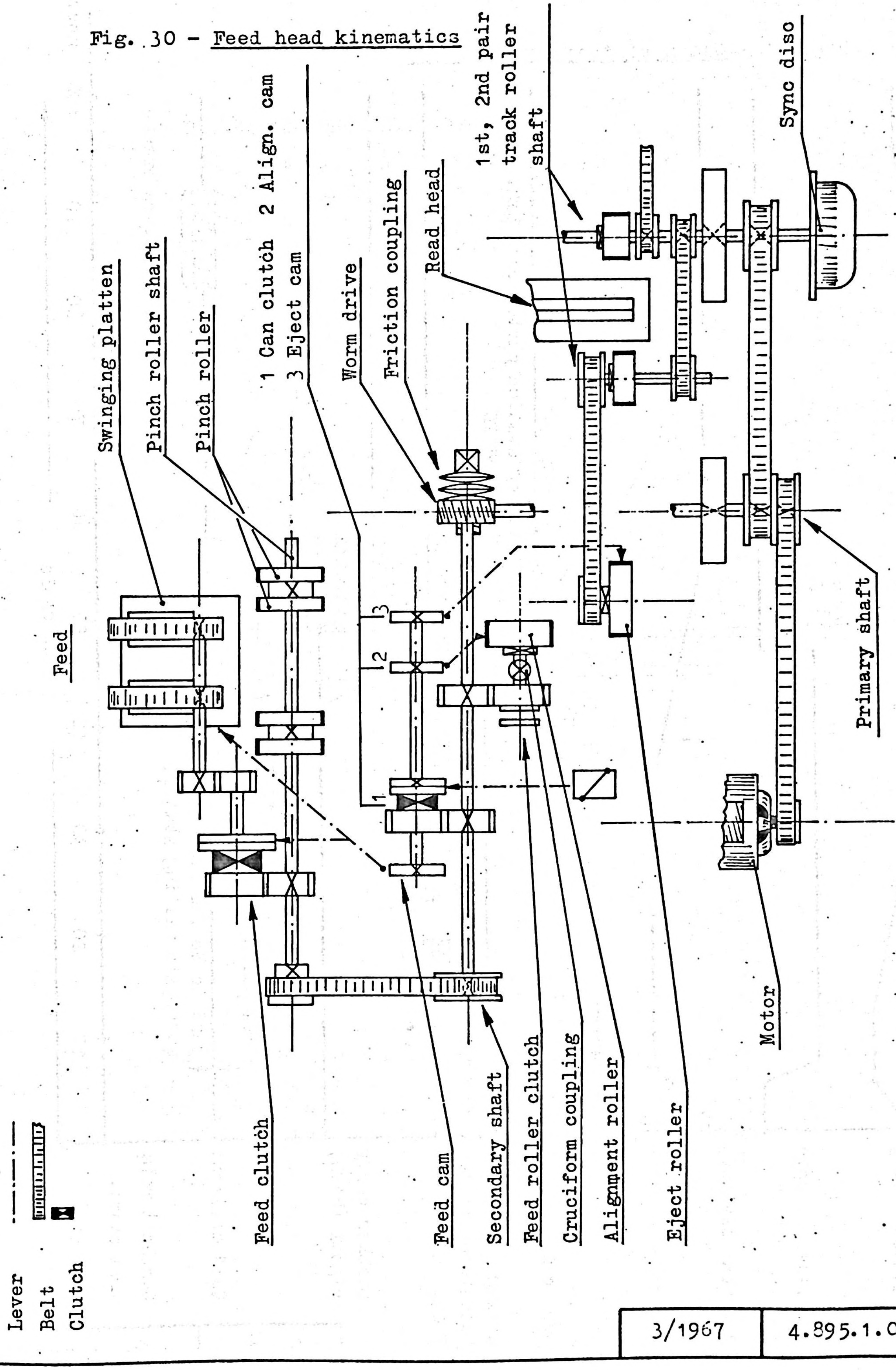
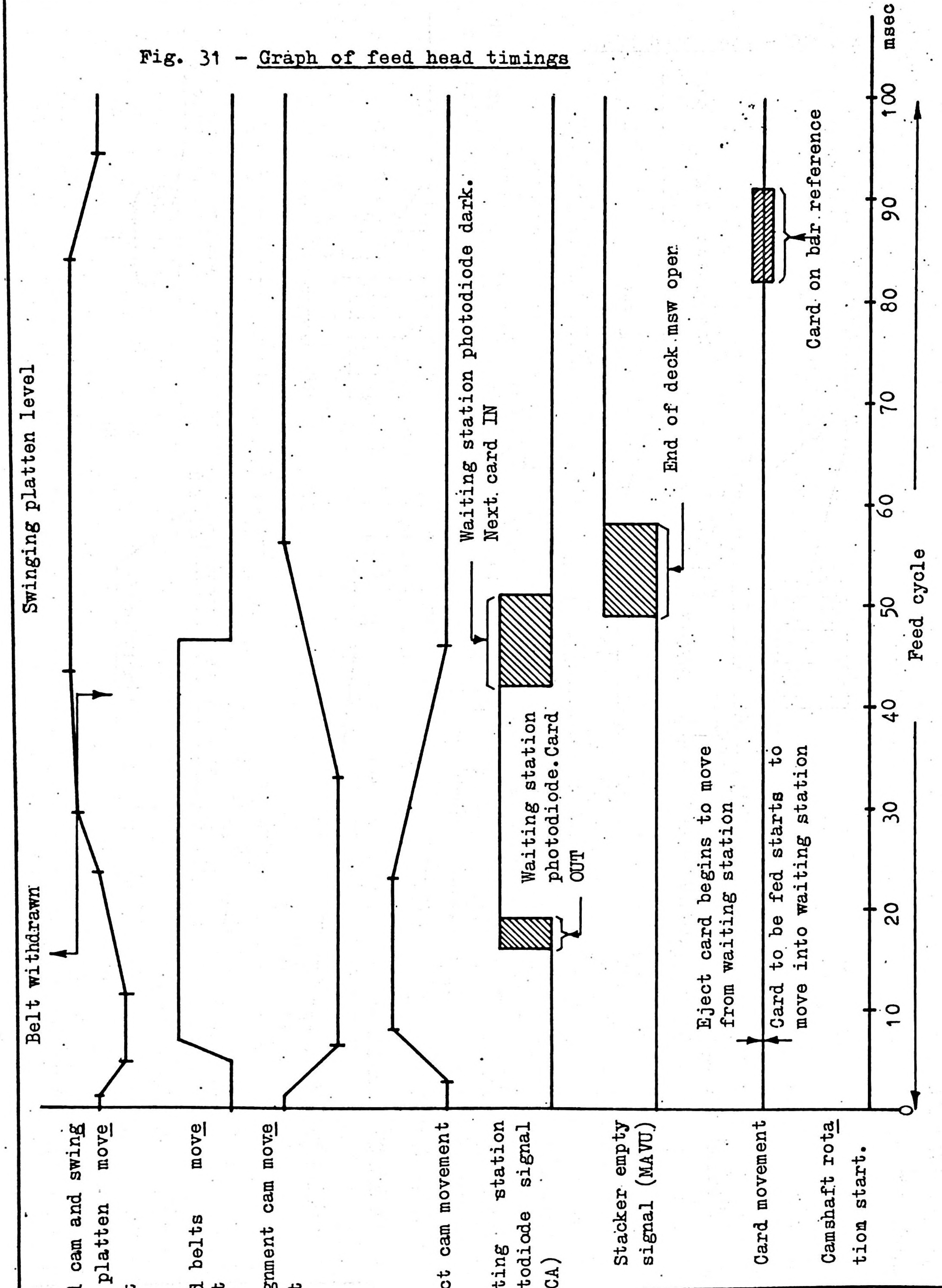


Fig. 31 - Graph of feed head timings



2.3. READ AND SYNC PHOTODISC GROUPS

The read head unit detects the transit of the card along the track and interprets the information on it.
The sync photodisc unit synchronizes the reading of the card, allowing its interpretation column by column.

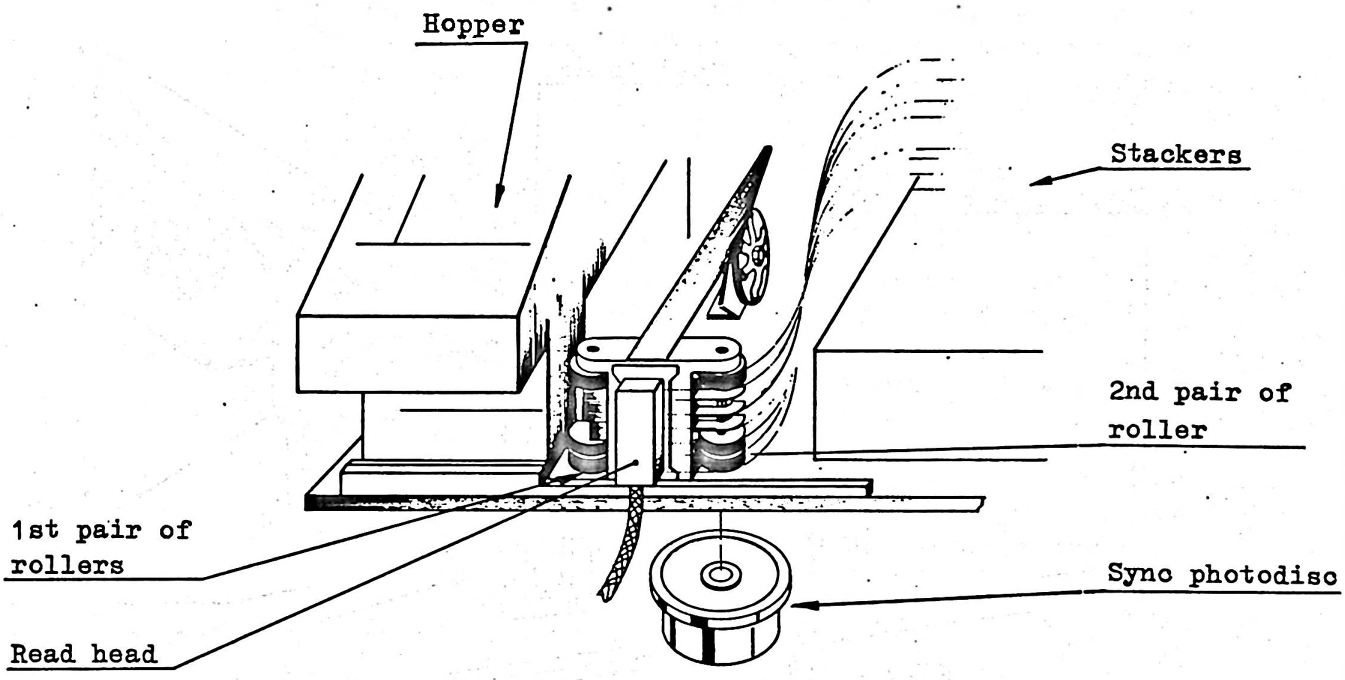


Fig. 32 - Read head and sync group - positioning

The read head is located in the card path, between the 1st and 2nd pair of card transport rollers.
The photodisc is secured directly to the lower extremity of the 2nd pair of transport rollers driving shaft.

2.3.1. Read head

The read head achieves the reading of the card with a row of 12 photodiodes.
They are so positioned to allow each photodiode to interpret one row only.
The card during its itinerary, runs between the photodiodes and the lamp that illuminates them.

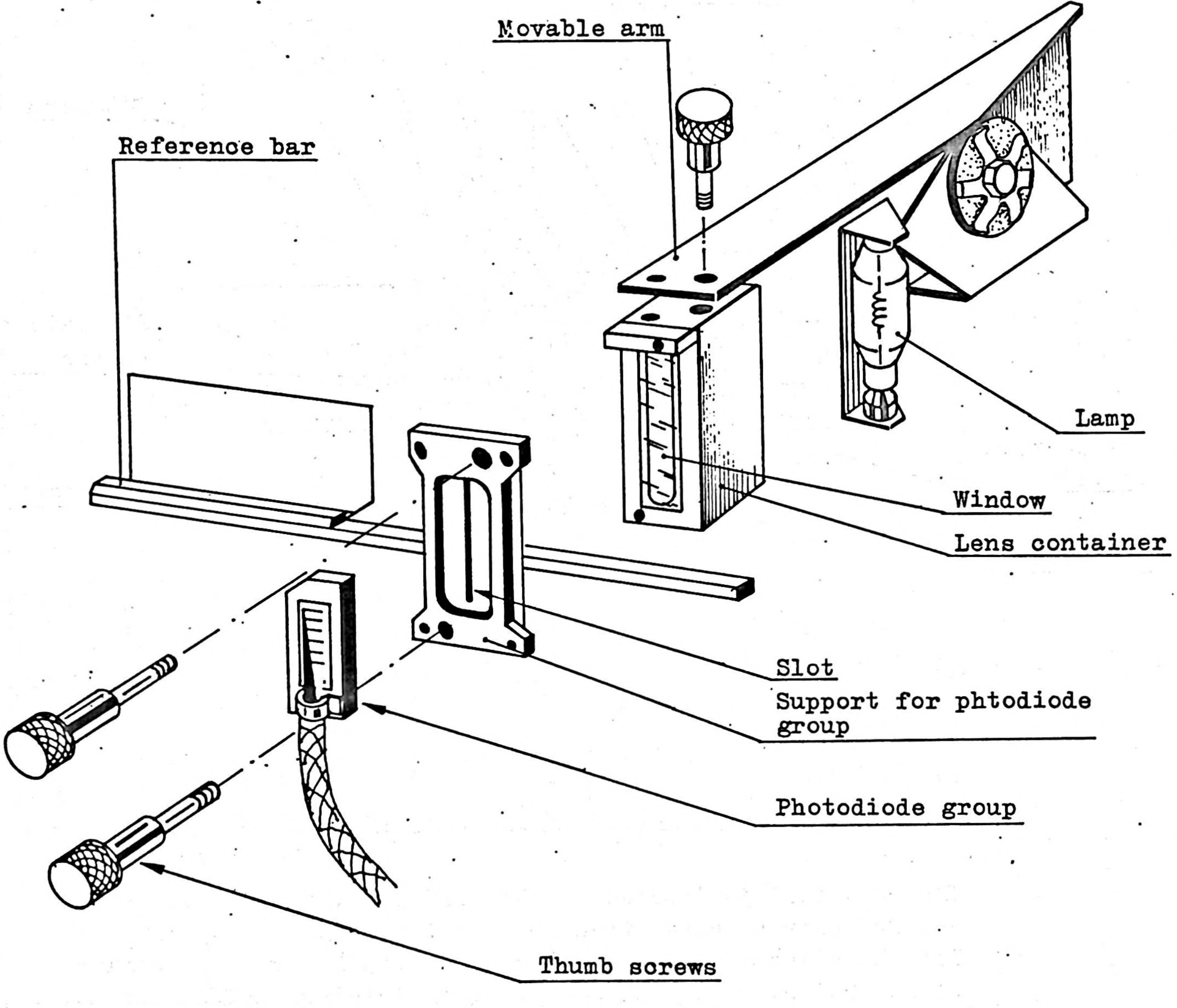


Fig. 33 - Read head assembly

The whole assembly may be sub-divided into four component parts:

1) - The read station. Consisting of a container into which 12 PHILIPS BPY 10 photocells are fitted and a connecting cable.

2) - Photodiode group support. The read head is fitted directly to it with the card running behind it.The structure may be oriented to perfectly align the slot present on the support, with the axis of any column of the card.

3) - A lens container. It is a rectangular machined block having two slots to allow the light from the source to enter and exit.
The card runs on the dust excluding glass side.
The lens is of the convex plane type to give a beam of parallel light to the photodiodes.
The whole assembly is mounted on a swinging arm to ease cleaning.

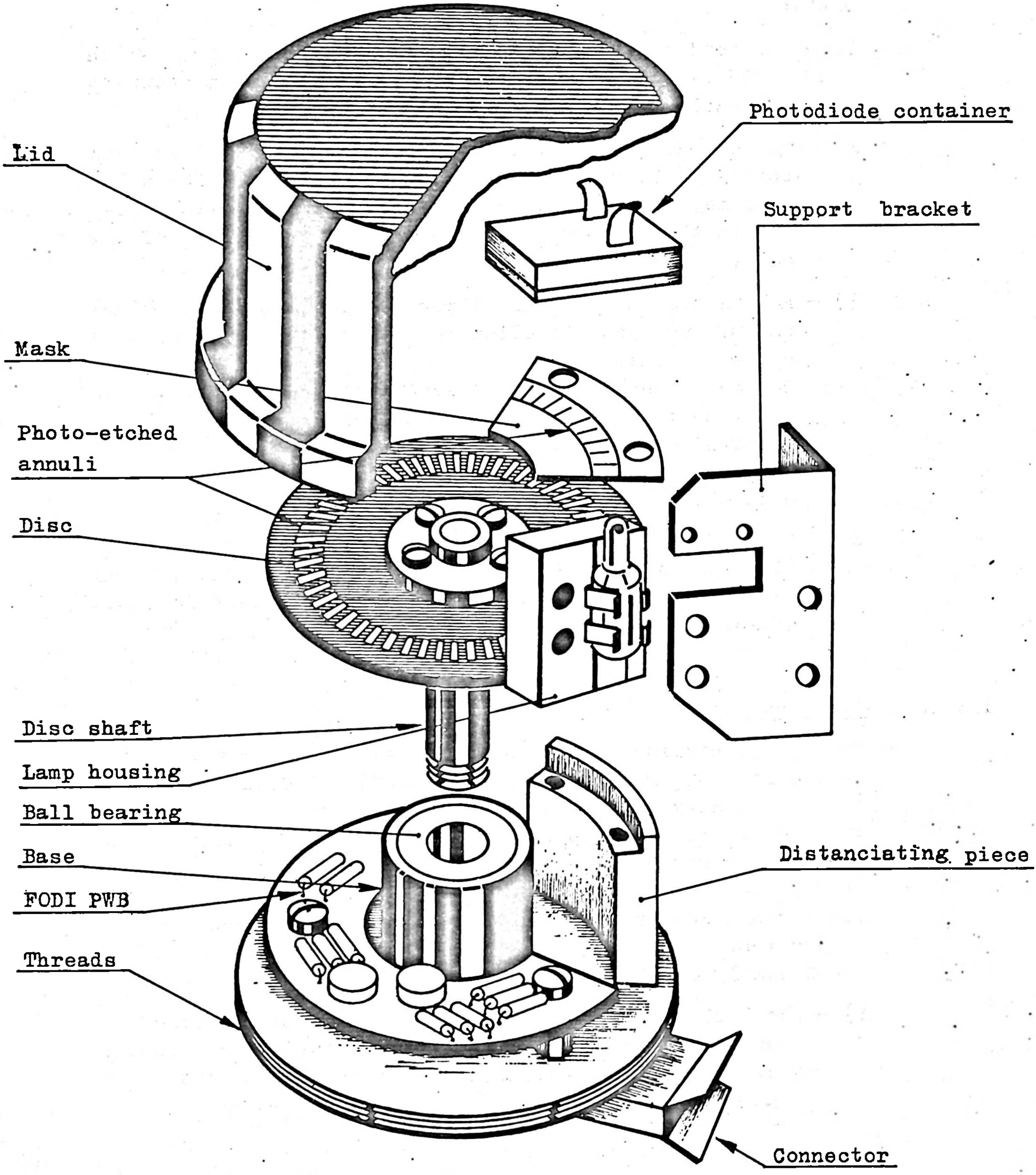
4) - The read lamp. It is of the quarts line, tungsten iodine type and positioned at the lens focal point.It is mounted in a spring loaded pin contact holder for ease of assembly and removal.

2.3.2. Sync photodisc

The sync photodisc is that device used to synchronize the card during the reading phase. It is fitted directly to the lower extremity of the 2nd pair of transport rollers driving shaft. It furnishes a continuous train of impulses with a frequency corresponding to 15 pulses for each perforation step of the card.
The whole assembly is enclosed in a metal container for dust protection.
The assembly may be sub-divided in the following groups:

1) - The FODI board. Fitted to a cast and machined base. Upon this base are also fitted two electrical connectors. The outer circumference is threaded to take the high domed lid.

Fig. 34 – Sync photodisc group



2) - The photo-etched sync disc. Fitted to a sleeved shaft which rotates within two roller bearings. The disc is made of plastic having an annulus etched with 918 segments which chop the light from the lamp creating, consequently, a continuous train of sync signals.

3) - The lamp group. Fitted onto the support bracket. This comprises a focussing lens to direct the light onto a mask.

4) - The photo-etched mask. Fitted directly on the distanciating piece. It has segments etched on it identical to those of the photodisc, used to strobe the passage of light. This gives a high dark-light resolution.

5) - The photodiode group. Only one photodiode is secured to the support bracket. Receives the light chopped by the photodisc and mask.

6) - The support bracket upon which the lamp and the photodiode container are fitted.

7) - The high domed, threaded, dust protective cover.

2.4. CARD TRANSPORT

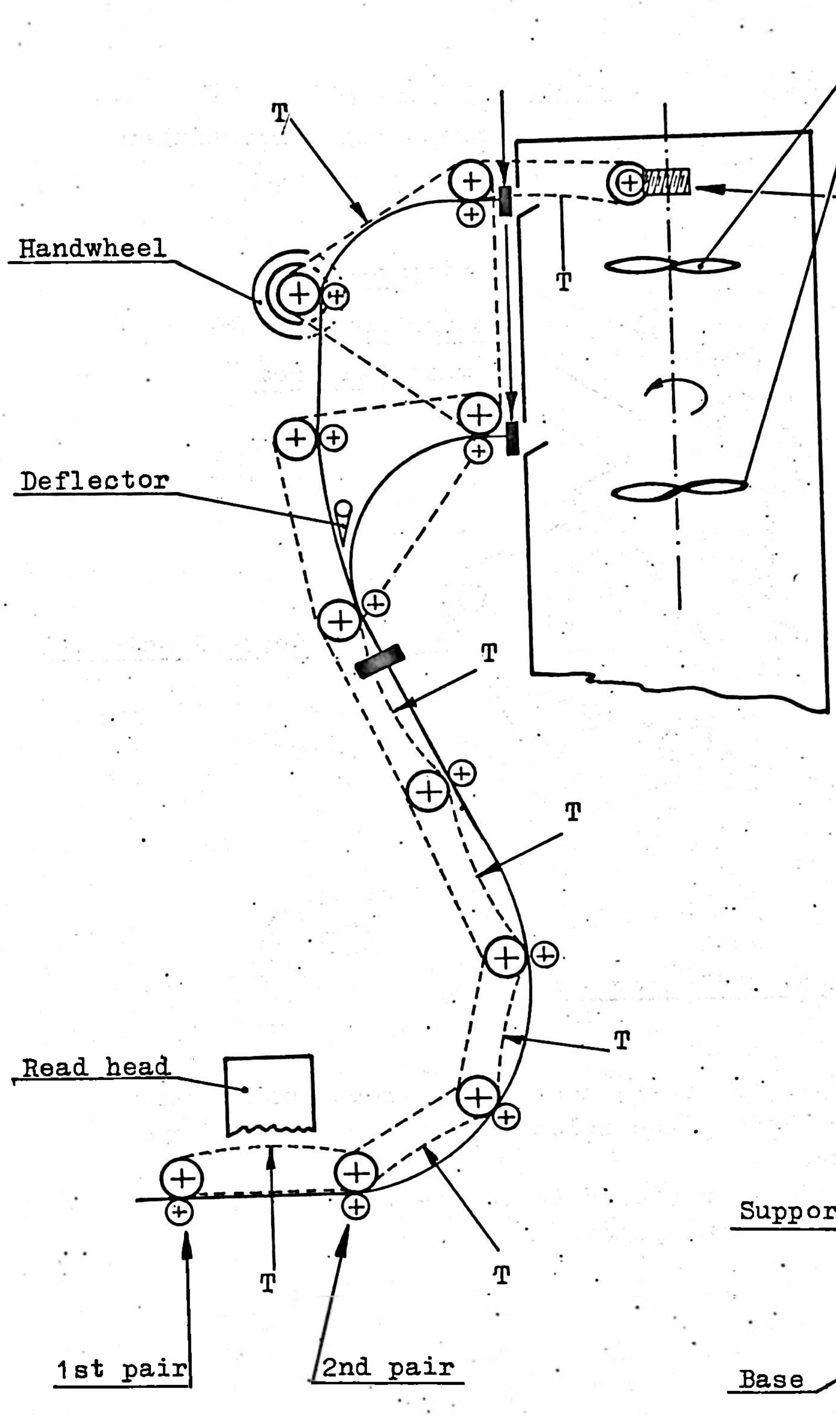
2.4.1. Read and eject track

The read and eject track is that part of the machine that assumes the task of transporting the cards from the feed head group to the stackers.
At the start of the card path, the card is read, towards the end, selection is done, before the card is stacked.
The track is made up of a series of metal rails disposed in a double S.
Card transport rollers and their idlers are positioned around the rails to provide constant traction to the moving card.
Drive transmitted to the rollers, from the shaft of the 2nd pair of rollers, is propagated by a chain of toothed belts and pulleys. See figs. 30 and 35.
At a given point, the track splits to route the cards, when commanded, in two stackers: either the normal or the eject stacker.
The handwheel fitted to the shaft of the last but one roller, has the purpose of moving the whole chain of transmission for manual operations.

2.4.2. Rollers and idlers

These are fitted to cast supports screwed directly to the machine base. Both the roller and idler shafts run in ball bearings. They protrude beyond the machine base and have toothed pulleys for drive input.
All the idlers are identical and mounted on the card guide rail mounting posts. The only exception are the 1st and 2nd pairs of idlers which, having to exert considerable pressure on the card, are fitted to the swinging wall of the waiting station.

Fig. 35 - Read and eject track



⊕ Rollers
⊕ Idlers
----- Belts
T Belt Tensioners
▬ Control photodiodes

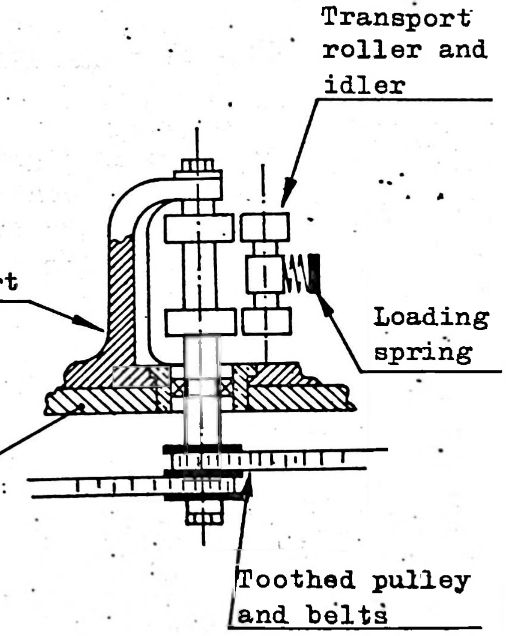


Fig. 36 - Drive to eject roller

2.4.3. Mechanical deflector

The mechanical deflector is used to direct the cards either in the normal or in the eject stacker.

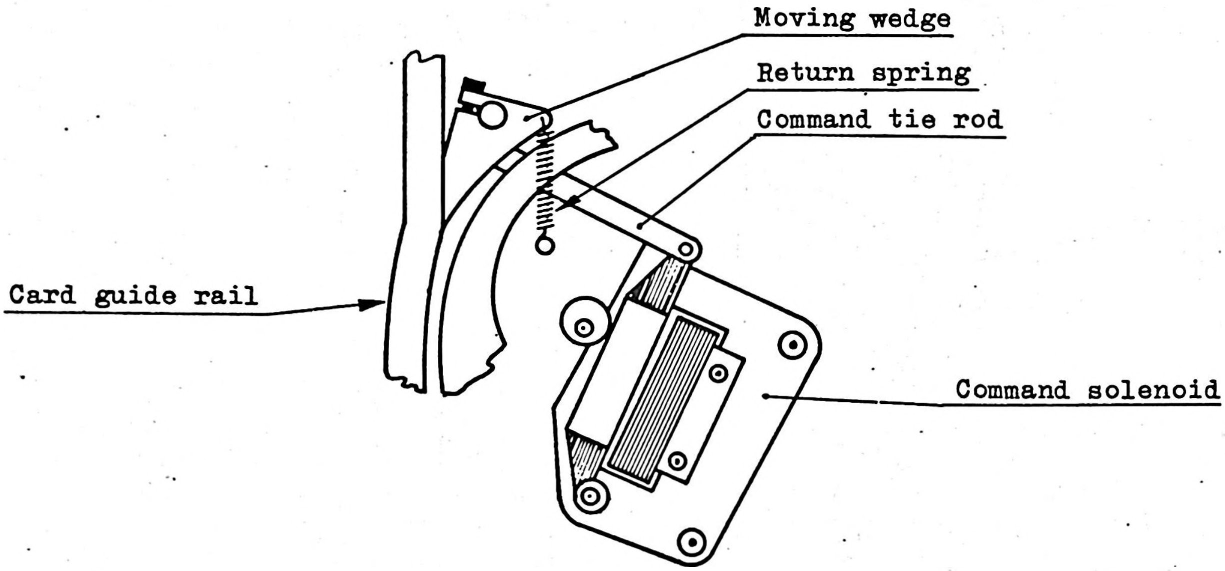


Fig. 37 - Mechanical deflector - at rest

As shown in fig. 37, the operation is bi-directional functioning and controlled by the solenoid through a tie rod and a moving wedge.
The deflecting blade is restored to the rest position (normal stacker), by a return spring.

2.4.4. Track control photodiodes

Three identical photodiodes are situated in 3 different places to check card flow.
One is just before the mechanical deflector, the other two are at the entrance to each stacker. See fig. 35.
Each track control photodiode is fitted directly onto the card guide rail and secured with a thumb screw.
An electrical connector is supplied.

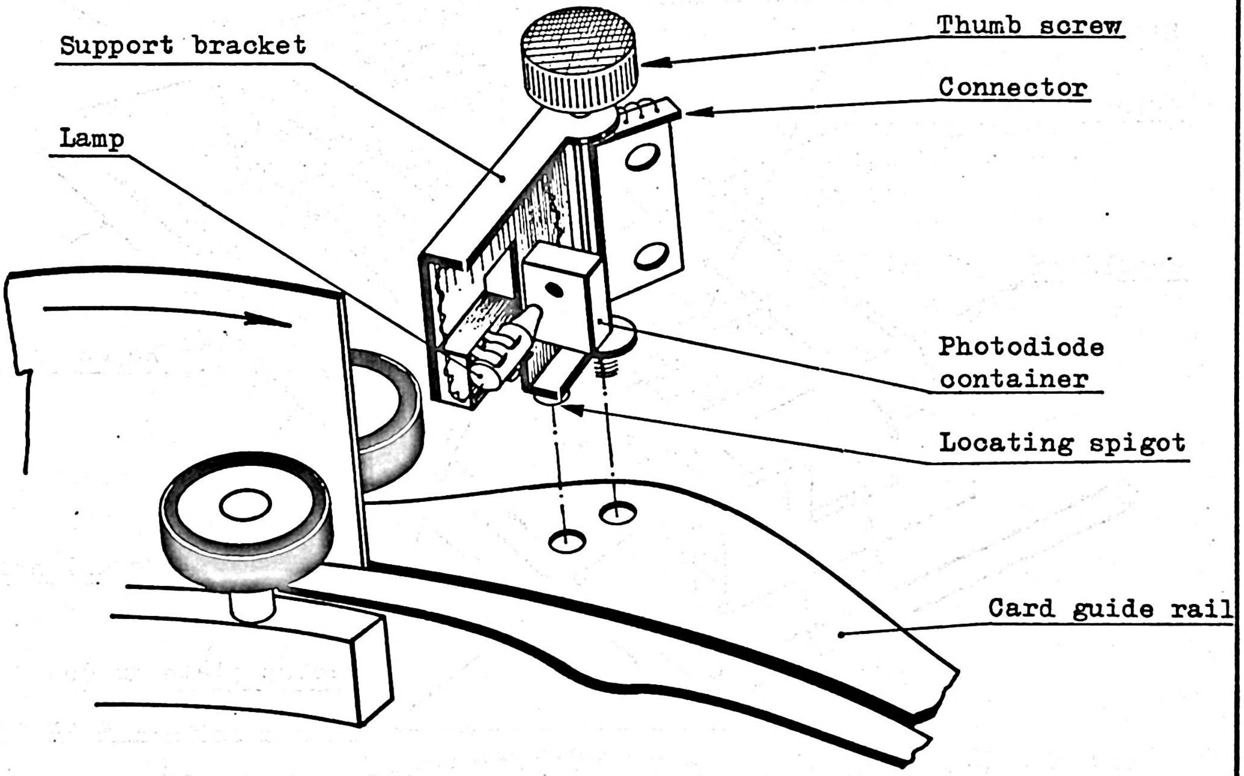


Fig. 38 - Track control photodiode

2.5. STACKERS

Two stackers are provided. The normal stacker has a capacity of 2000 cards, the reject one only 500.
Both stockers are houced in one unit which is secured to the machine base. The last components of the card track assembly are fitted in the stackers themselves.
Fig. 39 gives the general arrangement of components parts for both stackers.

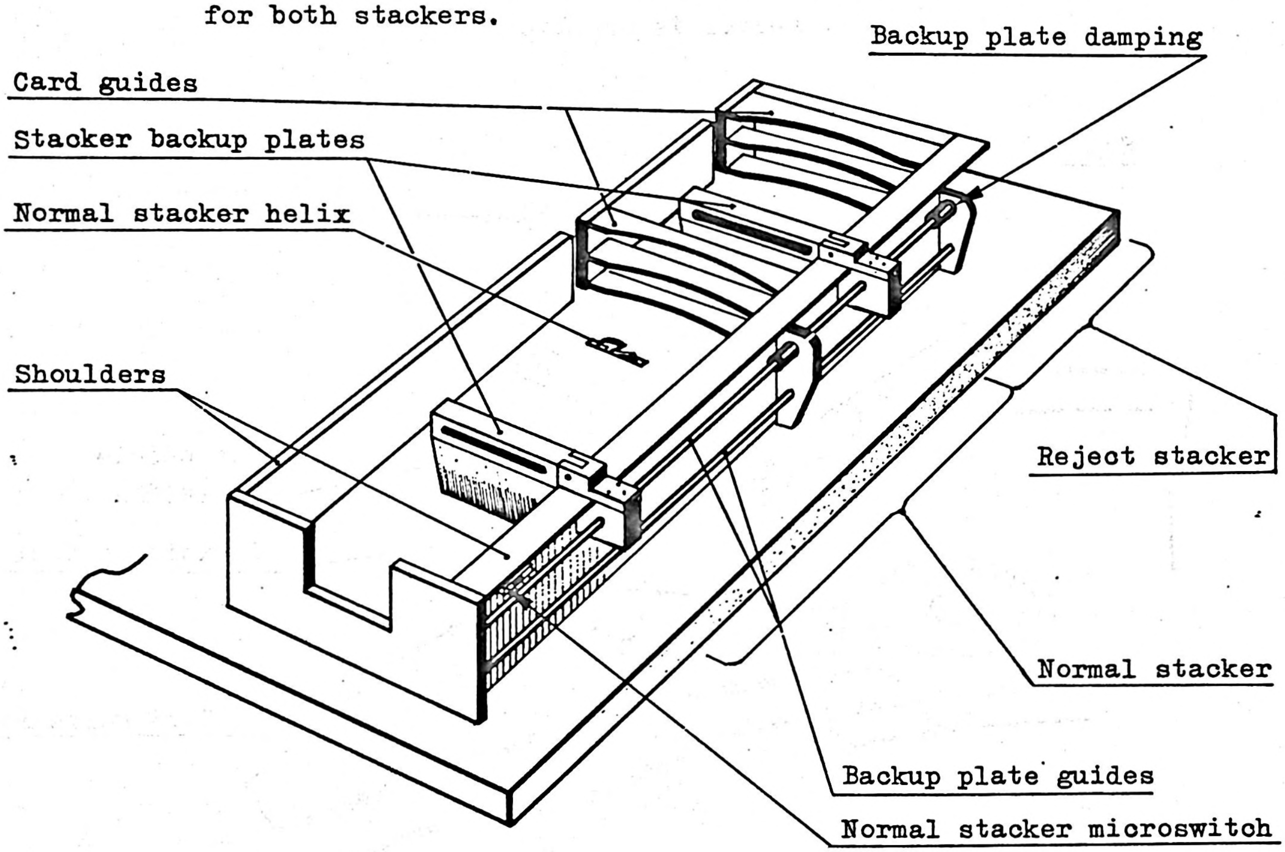


Fig. 39 - Stackers general view

The main constituent parts and their uses is hereby given :

1) - Right and left hand side shoulders for deck guidance.

2) - Stacker base, upon which the card deck rests.

3) - Card guides to follow the cards from the track to the rubber damping pad on the R.H. shoulder.

4) - Rubber damping pads, one for each stacker, used to absorb the impact force of the card as it leaves the track (4.4. m/sec.).

5) - Stacker input pawls. These are positioned at the output side of each stacker to prevent the card, bouncing off the rubber pad, from returning back into the track.

6) - Stacker helices. These protrude through two slots; collect and position the stacked cards towards the backup plates.

7) - Card backup plates, used to maintain a slight pressure on the cards and therefore in constant touch with the helices. They are fitted on sliding supports and may be swung up to ease unloading.
Each plate has a spring giving it the required pressure and damping at the full out position.

8) - Safety microswitches. Used to detect, for each stacker, the full condition.

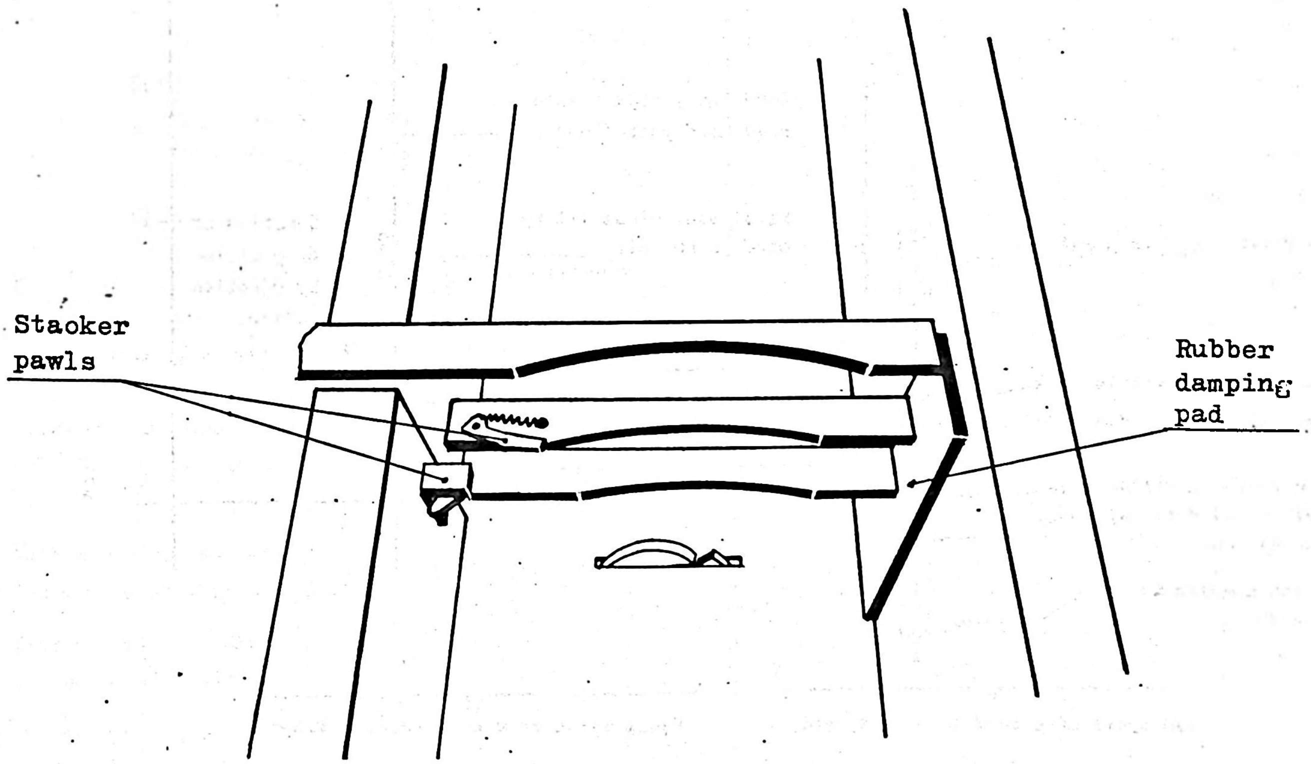


Fig. 40 - Stacking devices

The two helices are fitted on the same shaft, driven by a worm gear arrangement which receives motion from the eject track. See fig. 35

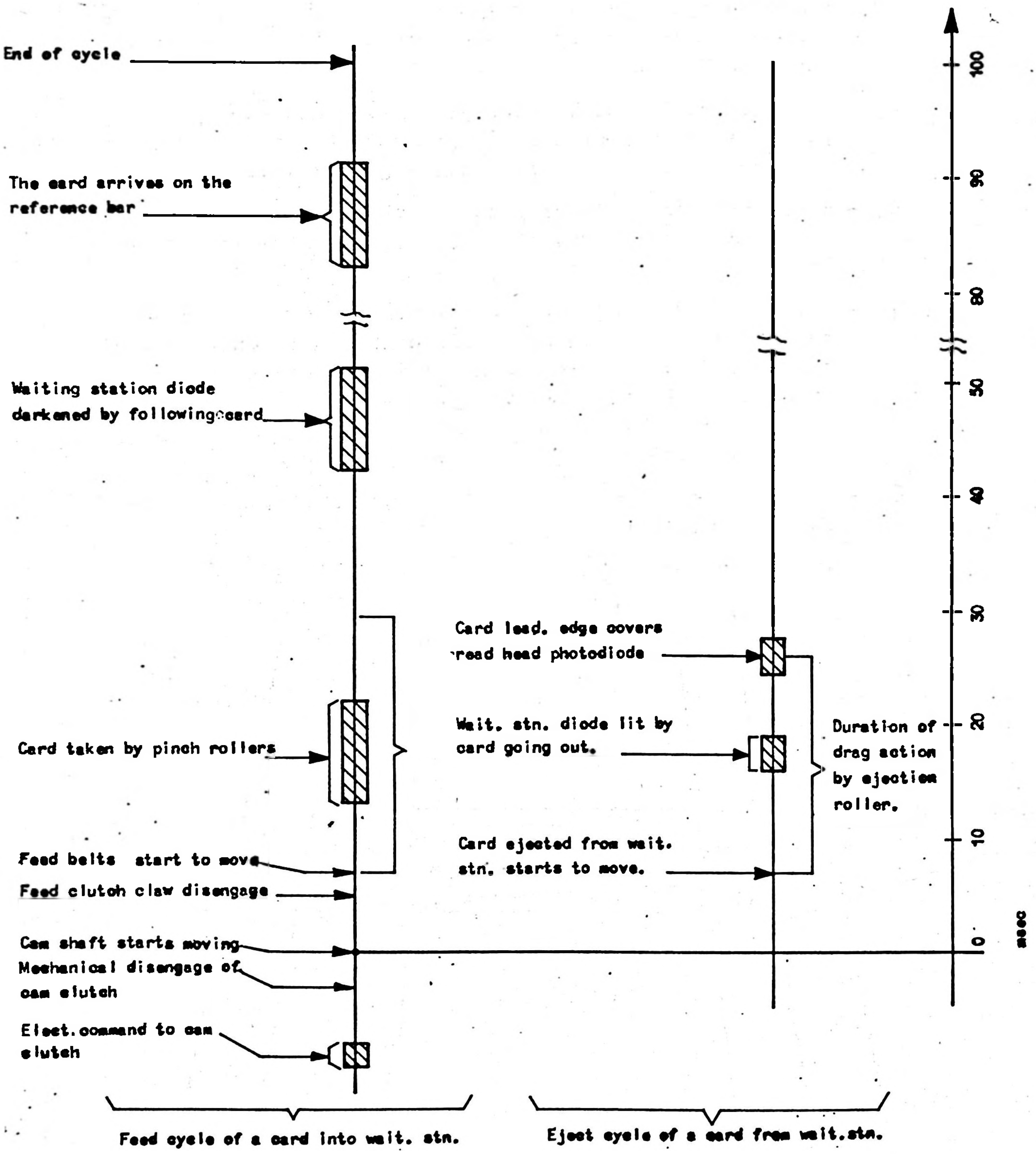
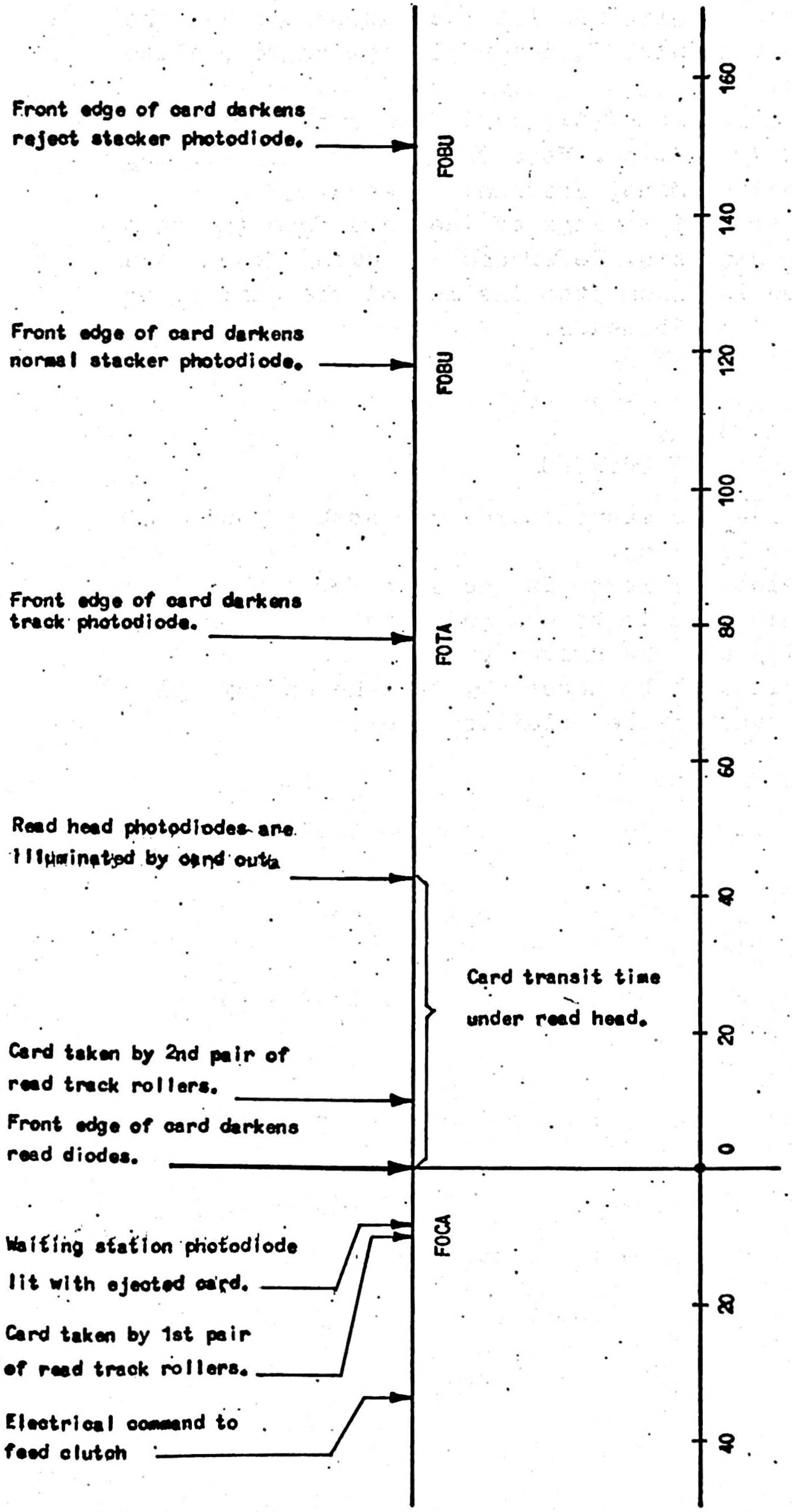

End of cycle
The card arrives on the reference bar
Waiting station diode darkened by following card
Card taken by pinch rollers
Feed belts start to move
Feed clutch claw disengage
Cam shaft starts moving
Mechanical disengage of cam clutch
Eject.command to cam clutch
Card lead. edge covers read head photodiode
Wait. stn. diode lit by card going out.
Card ejected from wait. stn. starts to move.
Duration of drag action by ejection roller.
100
90
80
50
40
30
20
10
0
msec
Feed cycle of a card into wait. stn.
Eject cycle of a card from wait.stn.

Fig. 41. – Feed and eject cycles graphic

Fig. 42 - Graphic of card transit time from waiting station to stackers.


Front edge of card darkens reject stacker photodiode.
FOBU
Front edge of card darkens normal stacker photodiode.
FOBU
Front edge of card darkens track photodiode.
FOTA
Read head photodiodes are illuminated by card out.
Card transit time under read head.
Card taken by 2nd pair of read track rollers.
Front edge of card darkens read diodes.
Waiting station photodiode lit with ejected card.
FOCA
Card taken by 1st pair of read track rollers.
Electrical command to feed clutch
160
140
120
100
80
60
40
20
0
20
40

2.6. DIAGRAMS

The card during its transit from the feed hopper to the stackers must adhere to some fundamental timings to realize checks on its flow.

Fig. 41 shows the diagrams of two card feed cycles from the hopper to the waiting station. Note that the two cycles during continuous functionement, are simultaneous.

Fig. 42 shows the transit timings of the card from the waiting station to the stackers. Reference is taken from the stackers. Reference is taken from the moment the card obscures the read head photodiodes.

2.7. 50 HZ or 60 HZ MODELS DIFFERENCES

The LS 600 Card Reader is manufactured for both 50 and 60 Hz, 3 phase Power Supplies.

The asynchronous electric motor is the same for both models. The only things that need to be changed, are the primary shaft driving pulley and the driven pulley.

After the change, it will be necessary to take up any play on the pulley by means of the relative idler.

2.8. MIS 420 ELECTRICAL MAKE-UP

The mechanical componets of the LS 600 are interconnected to the D.O.E. and to the controller by an interface of connectors and terminal boards.
The disposition of the electrical components fitted to the MIS 420 can be observed in fig. 43 and may be described as follows:

1) - Microswitches for : - Feed hopper: to signal empty.
- Waiting station: interlock.
- Stackers: to signal stacker full.
- Cabinet: interlock.

2) - Photodiodes for : - Waiting station: check card transit (FOCA).
- Sync: emit sync signals at card passage under the read head (FOSI).
- Track: check card, in track, transition time and syncs deflector commands (FOTA).
- Stackers: check card entry into stacker (FOBO).
- Read head: sync and carry out card reading with relative error check (FOBO).

3) - Feed command : - Solenoid to release the cam clutch thereby causing card feed.

- Mech. deflector : - Solenoid to cause cards to go to reject stacker when commanded.

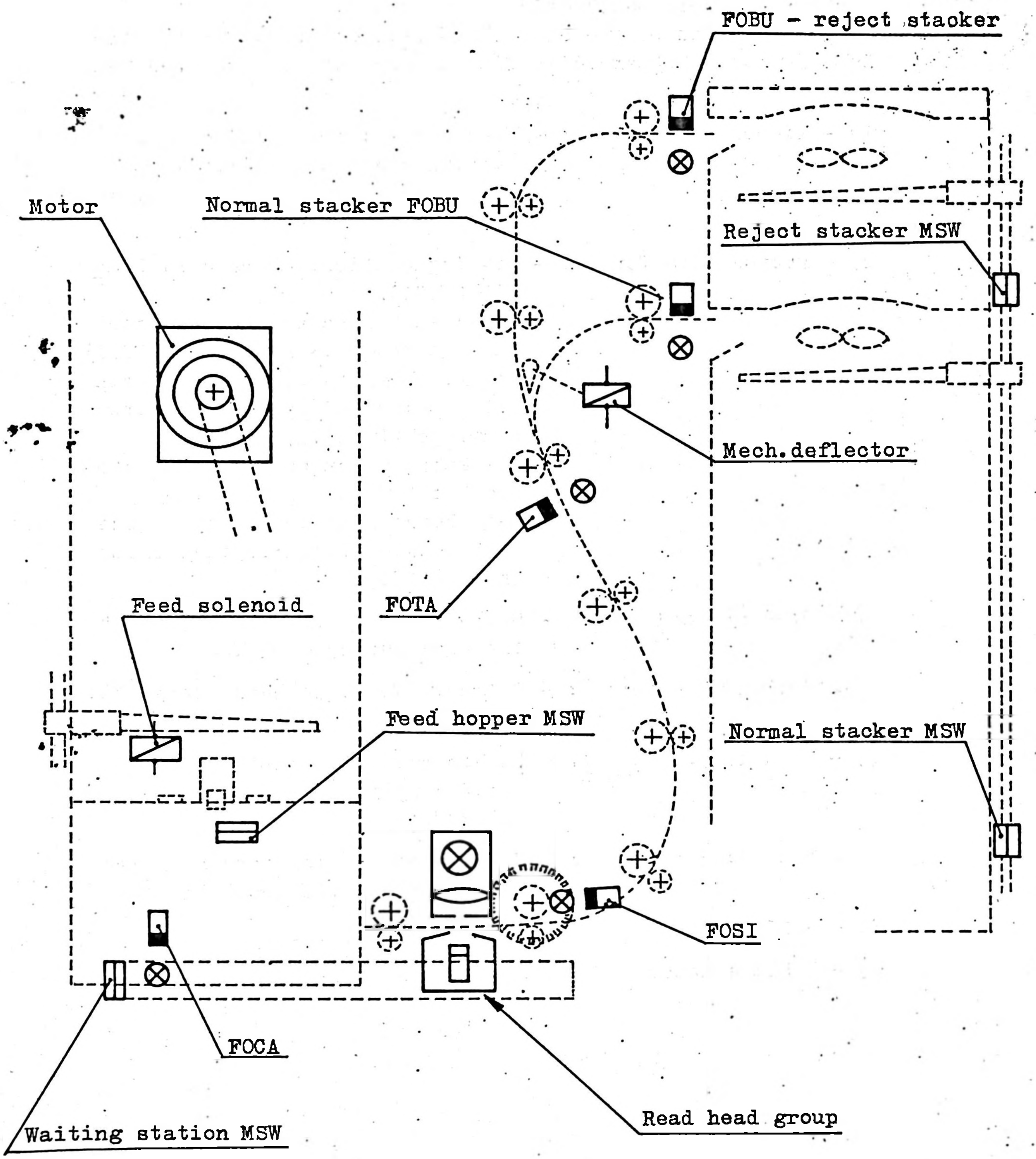
4) - Read lamp. : - Lights read head photodiodes. Power supply of 14.5 VDC from ALI 220.

- Photodiode lamp. : - Have a frontal lens and a power supply of 2.4 VDC from ALI 210.

5) - FODI PWB : - FOSI preamplifier.

6) - 3 Phase motor : - Complete mechanical drive.

Fig. 43 - MIS 420 electrical components location



2.8.1. MIS 420 schematic

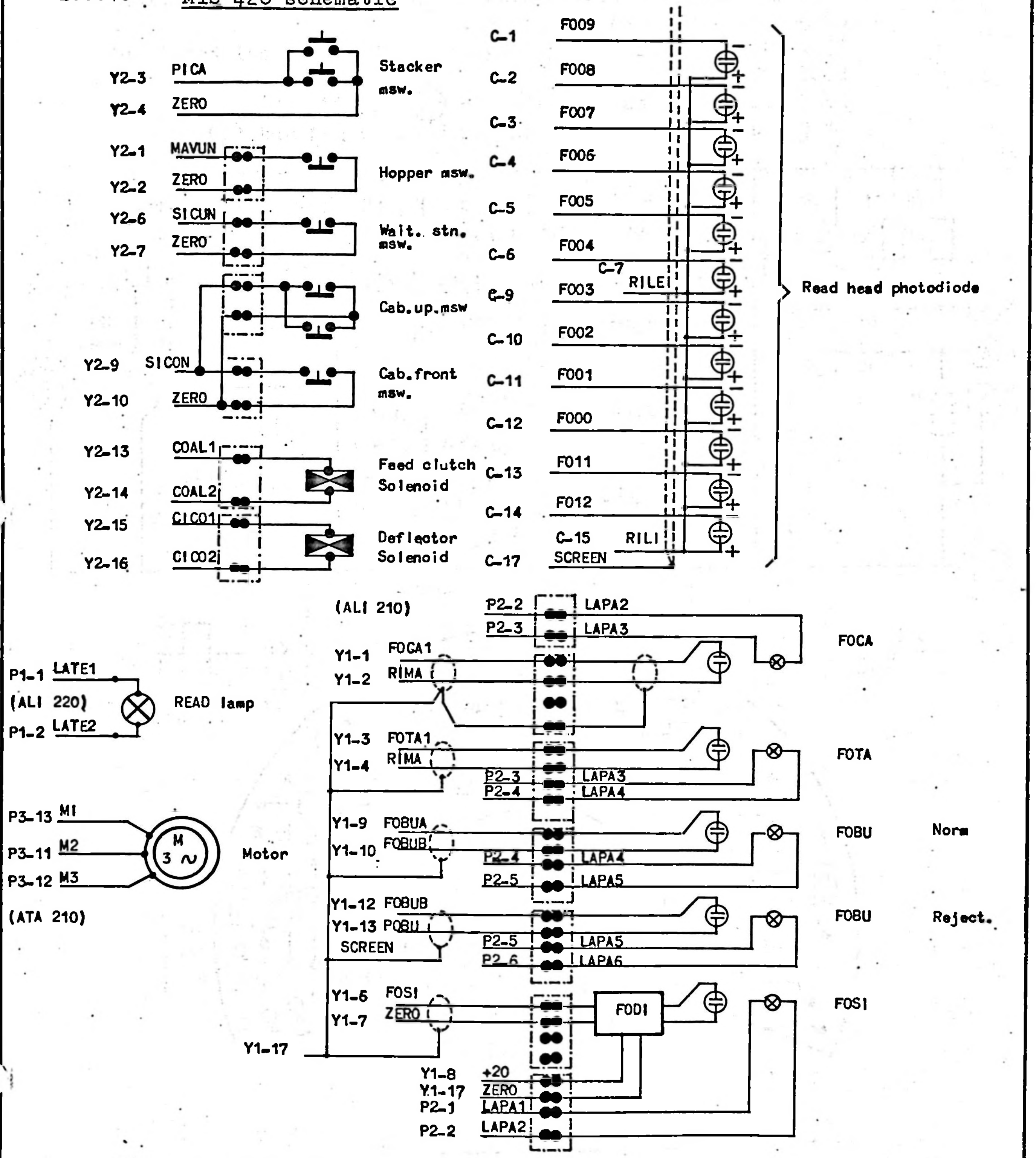


Fig. 44 - MIS 420 schematic

Fig. 44 shows the location on the machine, of the various connectors and terminal boards.
Fig. 44 shows the wiring diagram and the physical board of FODI PWB.
Photodiode FOSI is connected to ⑤ and ⑥. The output is at ① and ② and the input is between ③ and ④.

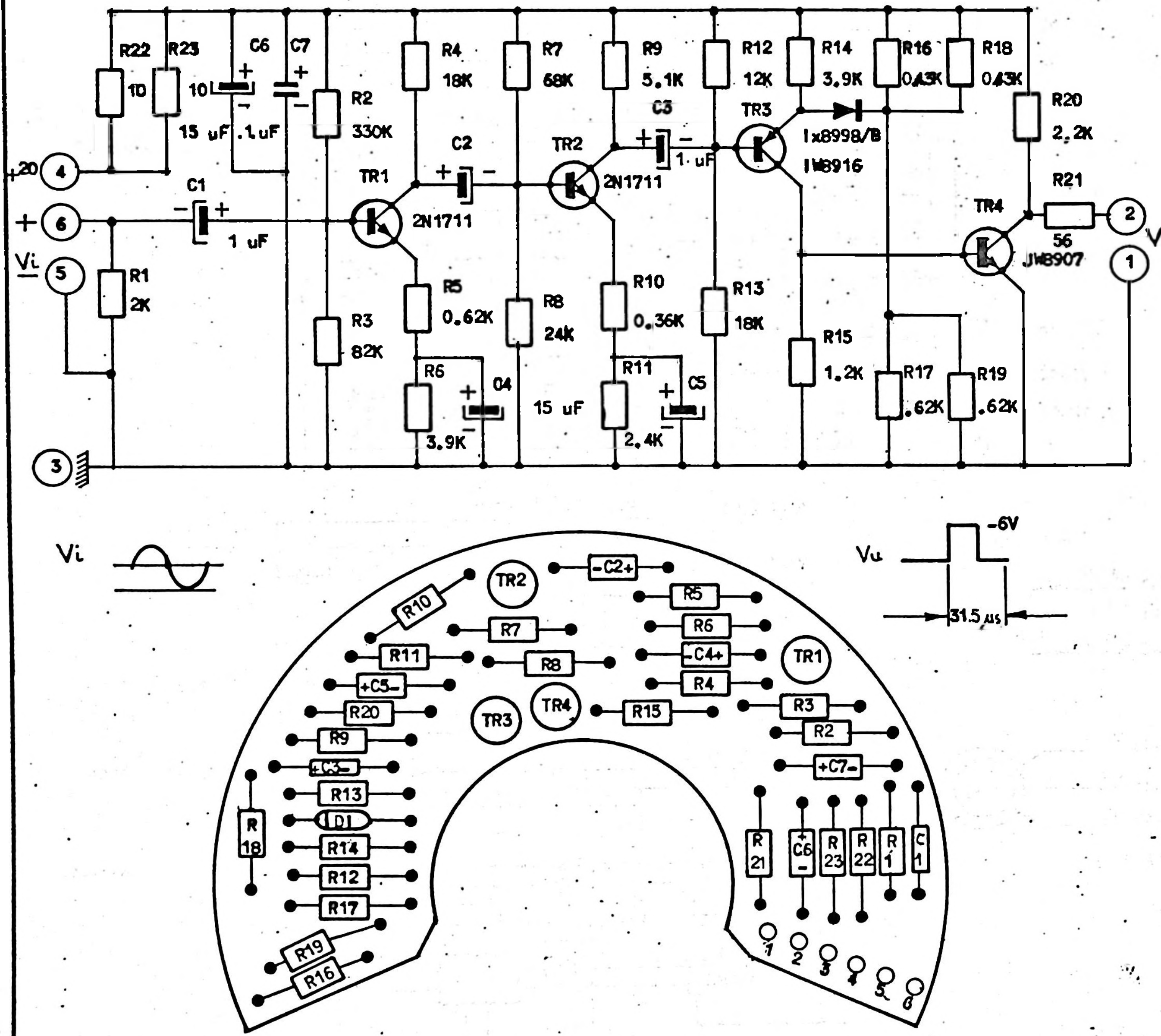


Fig. 45 – FOSI wiring diagram and board

2.8.2. Connections and signals

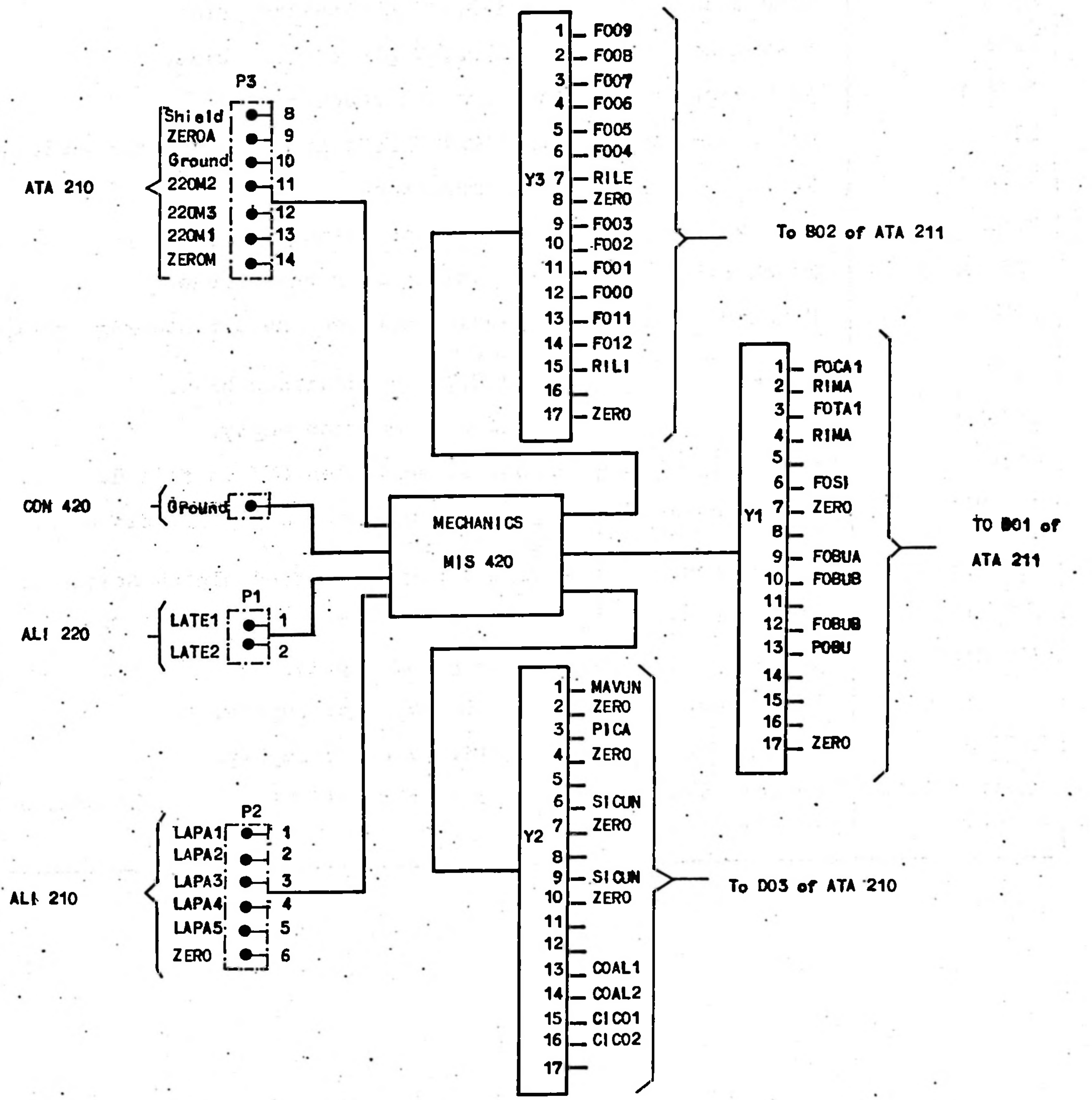


Fig. 46 - MIS 420 cable connections and signals

SIGNAL	WHERE	WHAT
F009 to F012	Read head	Read signals of the 12 head photodiodes.
RILE	Read head	Fixed 0.7 V photodiodes bias.
RILI	Read head	Fixed 0.7 V photodiodes bias.
FOCA 1	Wait.stn.	Card transit check signal.
RIMA	Wait.stn-track.	Fixed 0.7 V FOCA and FOTA photodiodes bias.
FOTA 1	Track	Card transit check signal.
FOSI	Sync disc.	FODI PWB sync output.
FOBU A	Stacker	Card passing over photodiode.
FOBU B	Stacker	Connection between the two stacker photodiodes.
POBU	Stacker	Fixed 0.7 V photodiodes bias.
MAVUN	Hopper	Signal at zero when empty.
PICA	Stackers	Signal at zero when ONE is filled.
SICUN	Wait.stn-Panel.	Signal at zero when any panel off a wait. station open.
COAL 1-2	Cam clutch.	Energize signal to feed clutch solenoid.
CICO 1-2	Deflector	Energize signal to mechanical deflector.
220 M1;M2,M3	Motor	3 phase power supply.
LATE 1	Read lamp.	Fixed 0 V power supply.
LATE 2	Read lamp.	Fixed 14.5 V power supply.
LAPA1 to LAPA 5	Photodiodes lamps.	Power supply for lighting photodiodes lamps.

3. OPERATIVE CONSOLE TAV 210

3.1. GENERAL

The console is the organ that groups all the pushbuttons and luminous indications necessary to the operator to interpret the functioning of the subsystem.
The console is situated on the top right hands side of the cabinet. It is construted following U.L. standards.
The whole pushbutton assembly is hinged to allow ease of maintenance.

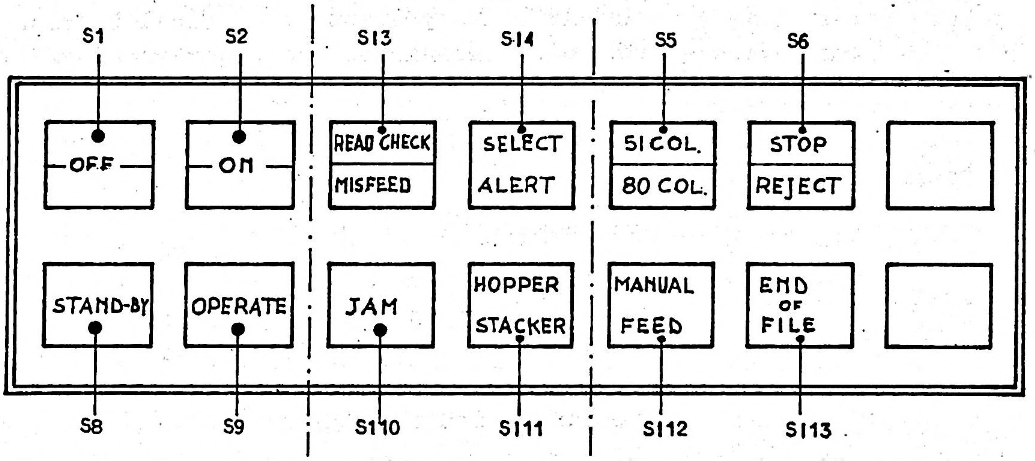


Fig. 47 - Pushbuttons and indicators

3.2. PUSHBUTTONS AND INDICATORS

1) - OFF - It is a monostable pushbutton with two coloured luminous indicators. The upper half red, the lower half yellow. The machine is not operable.
The yellow light indicates the presence of AC power.
The yellow and red indicates power supply failure (no + 20 VDC, motor and reader lamp power supply overheating).

2) - ON - It is a monostable pushbutton with two yellow luminous indicators.
When pressed the machine goes in STAND-BY.
One indicator signifies that both D.C. and A.C. are present at terminal boards.
The other signifies the motor running. If out, indicates either a jam, open waiting station or an open panel.
These indications must be reset before pressing ON to place system in the operable state.

3) - STAND-BY - It is a monostable pushbutton. When the subsystem is in OPERATE pressure on it puts the reader on STAND-BY, lighting the blue indicator with no possibility of info exchange with the CPU.

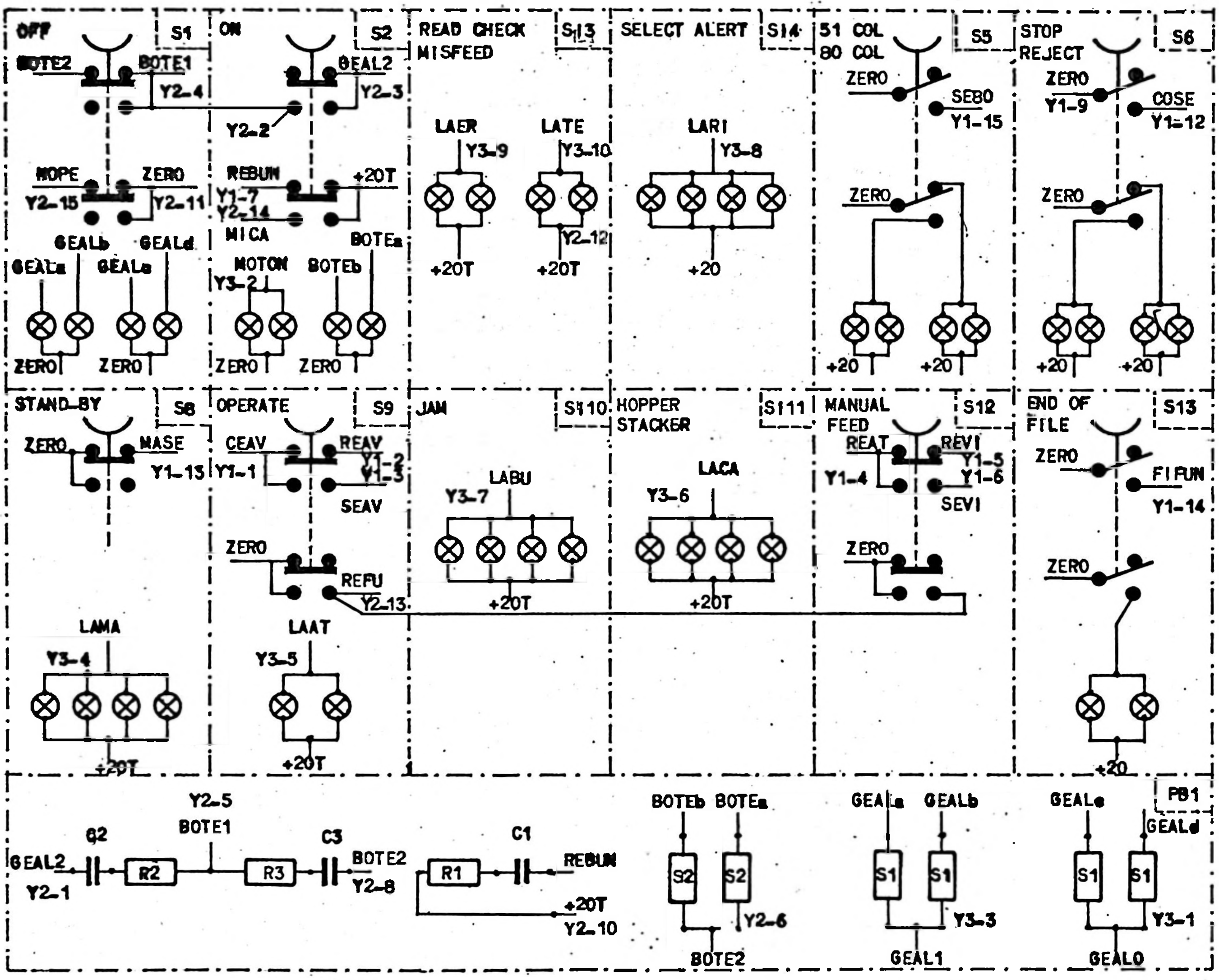
4) - OPERATE - It is a monostable pushbutton. When the subsystem is in STAND-BY pressure on it puts the reader on OPERATE, resetting any non-operable conditions present only if the cause had been removed.
The green light indicates the state allowing info exchange with the CPU.

5) - READ-CHECK MISFEED - The first, when lit, means that a read error was detected by the D.O.E. circuits.
The second, when lit, means that there has been a wrong card feed before it passed under the read head.

6) - SELECT-ALERT	- The light of this indicator means that the reject command is out of phase and that it has caused the entry of a card in the normal stacker instead of the reject one.
7) - JAM	- The light of this indicator signifies a jam any where in the track.
8) - HOPPER-	- The light of this indicator signifies that the feed hopper is empty and/or a stacker is full.
9) - 51 COL - 80 COL	- This bistable pushbutton has two lights indicating the condition selected.
10) - STOP-REJECT	- This bistable pushbutton with two lights enables the reader to stop or to reject a card when a read error occurs.
11) - MANUAL-FEED	- This monostable pushbutton, when is pressed, continuously feeds cards and resets any out of service condition if the cause had been preventively removed.
12) - END OF FILE	- This bistable pushbutton has one light indicator incorporated, which when lit, sends to the CPU the end of flow signal if the hopper is empty.

3.3. TAV 210 SCHEMATIC

Fig 48 shows the general location of components in the TAV 210. Those components fitted at the bottom of the console are recognised by the symbol PB1.



Note: R.C.groups are spark suppressors. R groups are series current limiters on indicator lamps.

Fig. 48 - TAV 210 schematic

3.4. CONNECTIONS AND SIGNALS

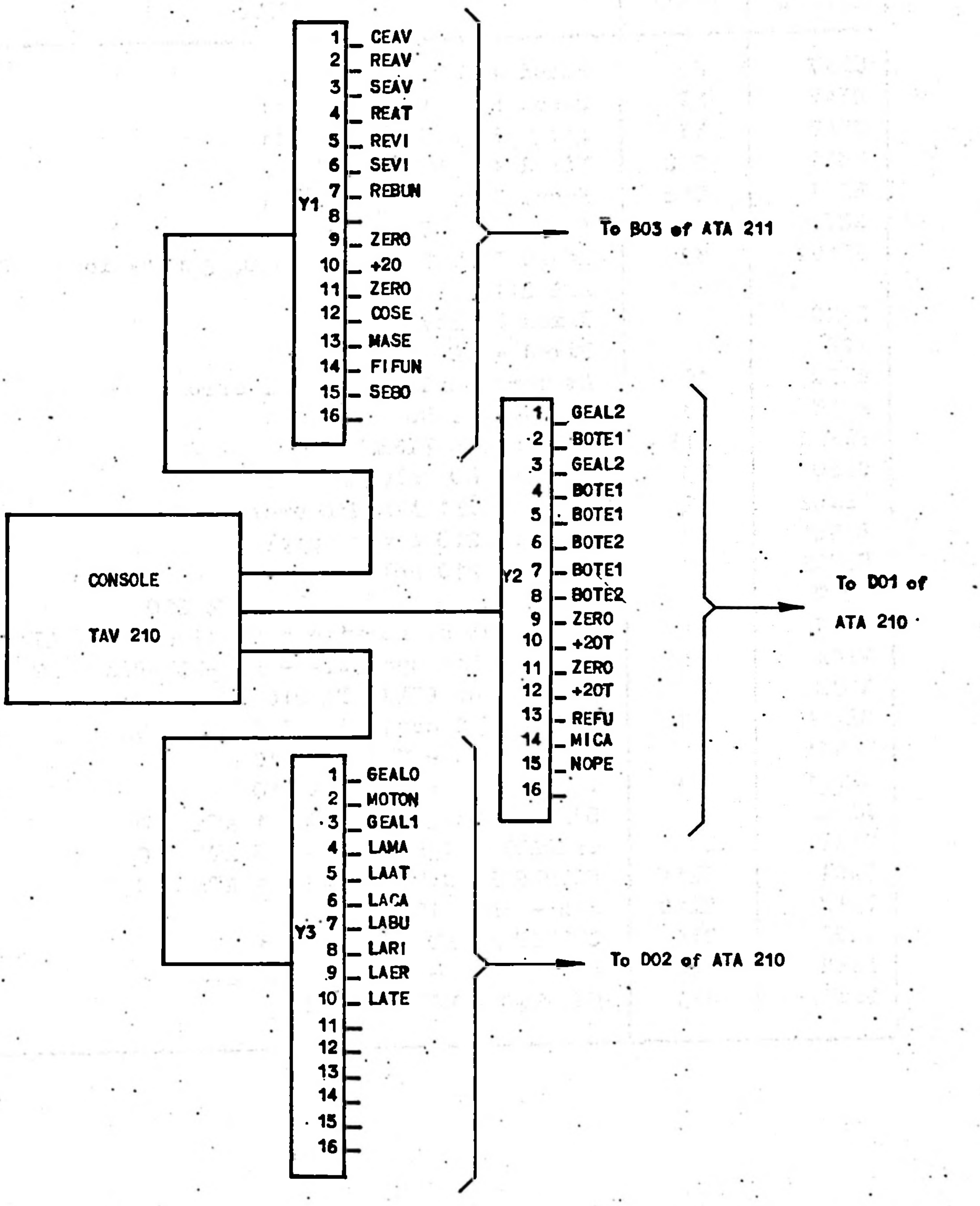


Fig. 49 - TAV 210 cable connections and signals

SIGNAL	WHERE	WHAT
CEAV	S9	Fixed + 5 V level
REAV	S9	Reset F.F. VIAT ATA 211
SEAV	S9	Set F.F. VIAT ATA 211
REAT	S12	Fixed + 5 V level
REVI	S12	Reset F.F. VIDA ATA 211
SEVI	S12	Set F.F. VIDA ATA 211
REBUN	S2	Reset F.F. BURI and BURO, generation REGE ATA 211
ZERO		Fixed 0 V level
+20		Fixed + 20 V level
COSE	S6	At zero card reject for error
MASE	S8	Set F.F. SECO
FIFUN	S13	Generation FISEN
SE80	S5	At zero 80 columns read
GEAL2	S2	Enables TL1 ATA 210 energized
BOTE1	S1	TL1 ATA 210 power supply
BOTE2	S1	TL1 ATA 210 hold on
+20T		+ 20 conditioned by TL1 ATA 210
REFU	S9	Reset out of service conditions. RL4 ATA 210
MICA	S2	Establishes operable - RL1-RL3-RL4 ATA 210
NOPE	S1	Generation ERBU ATA 210
GEALO	PB1	TL1 24 VAC conditioned OFF lights
MOTON	S2	Motor runs - RL3 ATA 210
GEAL1	PB1	OFF signal - RL2 ATA 210
LAMA	S8	STAND-BY signal - SECO 1 ATA 210
LAAT	S9	OPERATE signal - SECO B ATA 210
LACA	S111	HOPPER-STACKER - TECA 1 ATA 210
LABU	S110	JAM - ERBU ATA 210
LARI	S14	SELECT ALERT - RITA 1
LAER	S13	READ CHECK - SEGE 2 ATA 210
LATE	S13	MISFEED - NORA ATA 210

4. D.O.E.

4.1. GENERAL

The D.O.E. of the LS 600 is made up of several elementary units that opportunely connected allow information exchanges between the mechanics and the controller.
The elementary units making up the D.O.E. are:

ALI 210, ALI 220
ALI 290, ATA 210
ATA 211, VAR 220

For their physical location consult fig. 1.

4.2. ALI 210 - POWER SUPPLY

It comprises some of those circuits that are auxiliary to the normal power supply.
Fig. 50 shows the following circuits, fig. 51 their location:

1) - T1 transformer : used for power supply to the ATA 210 remote control circuits.
Power input is 220 VAC on P1 coming from ALI 290.

2) - Divider : made up of 2 pots, RV6 and RV7 and 5 resistances, R1 to R6. The power supply for the MIS 420 photodiode lamps is drawn from it. RV7 adjust the luminous intensity of FODI lamp, RV6 that of all other lamps.

Fig. 50 - ALI 210 schematic

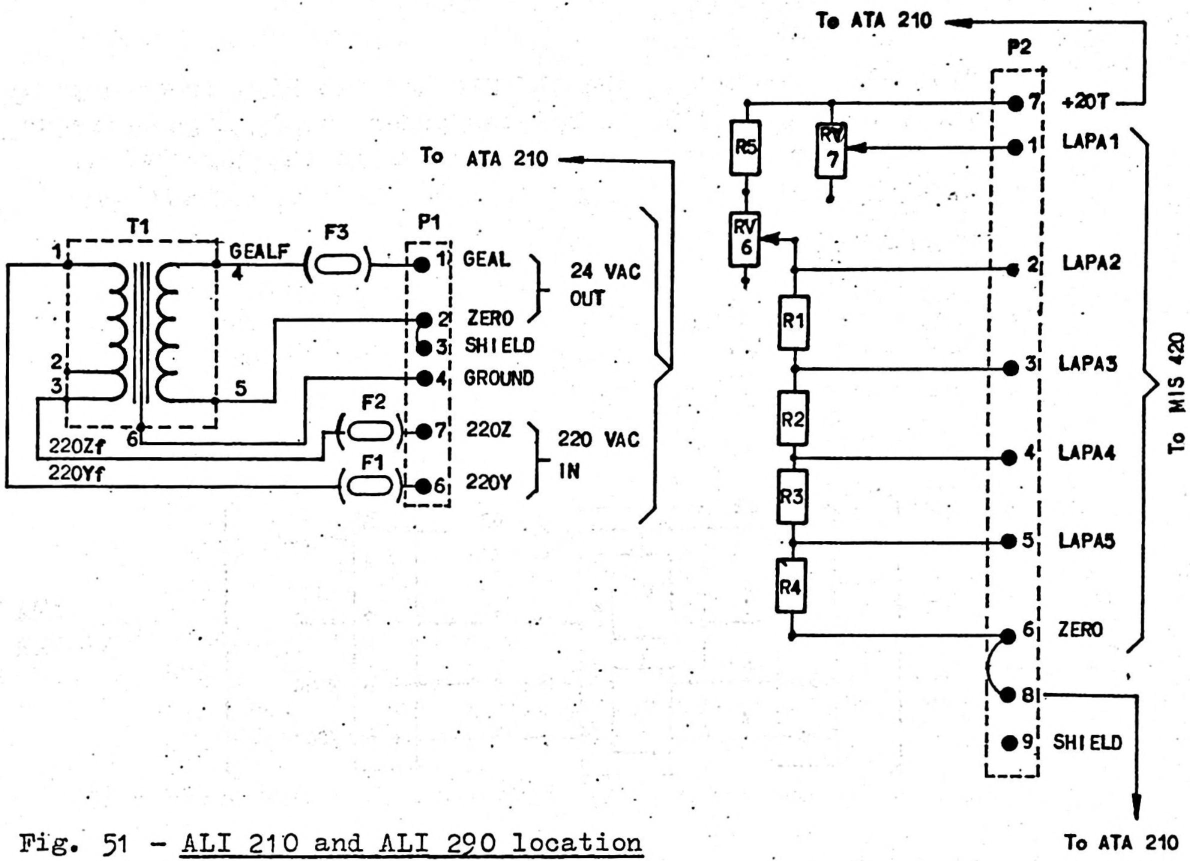
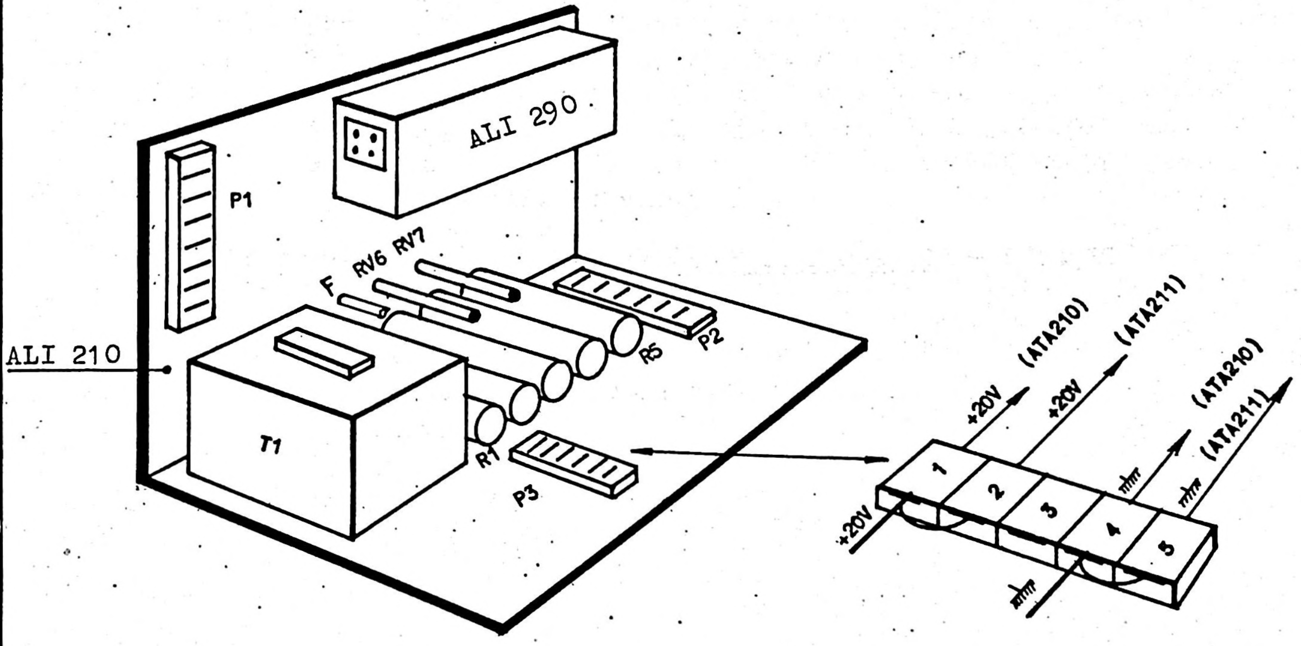


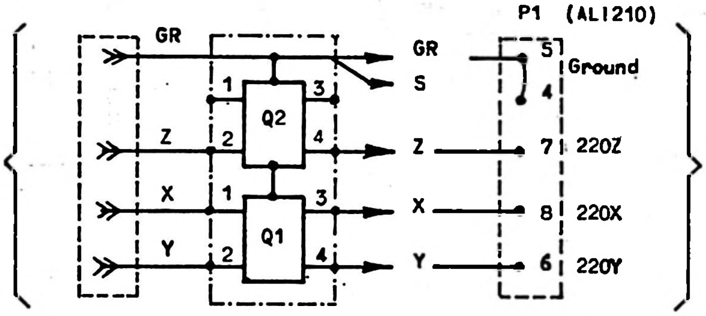
Fig. 51 - ALI 210 and ALI 290 location



4.3. ALI 290 PACK

This unit, housed in the ALI 210 has two high frequency attenuators, Q1 and Q2 to by-pass power supply high frequencies to ground.Their layout is shown in the fig. below.

3 ∅ IN



TO ATA 210, P2
VAR 220/B

Fig. 52 - ALI 290 L.P. filter

4.4. ALI 220 POWER SUPPLY

The ALI 220 is a 14.5 VDC power supply, stabilized and SCR diode controlled.
Fig. 53 shows the electrical diagram of the circuit that may divided in 6 sections to ease explanation.

1) - T1 power transformer. T1 has 3 secondary windings one of which is used to feed the power circuits.
The other two windings are used to give reference voltages and supply to the electronic circuits.
Each winding is protected by a fuse and a thermoswitch.

2) - Rectification and smooting. Employed on the read lamp power supply.
A diode controlled rectifier bridge (D5, D6, SCR1 and SCR2) is fed with 33.5 VAC and gives out a pulsed voltage filtered by L1 coil and C1-2-3 and 4 capacitors.

3) - Control circuit power supply. It is made up of the diode bridge rectifier (D1, D2, D3 and D4) and the R3, D7 and R13 group is used to square up the pulsing waveform utilized in the phase control circuit.

4) - Phase control circuit. It utilizes transistor TR2, RV1, R4, R5, R6 and C5 capacitor to establish the SCR firing start in sync with the average value of the bridge output.

5) - Control and stabilization circuit. Employs components TR1, R10, D8, R7, RV2, R8, C6, R11 and R9.
This circuit receives the feed-back signal at 1 and depending on it sets the sync for TR2. Adjustments may be set externally by shifting the link from 15-16 to 15-14. See fig. 54 and 55.

6) - Rectification and stabilization. Used for the secondary voltage of - 22 V. Comprises bridge D9 to D12 and group R14, R15, R17, ZL 22 and C8 for stabilization and smoothing.
This circuit is for on optional device.

Fig. 53 - ALI 220 schematic

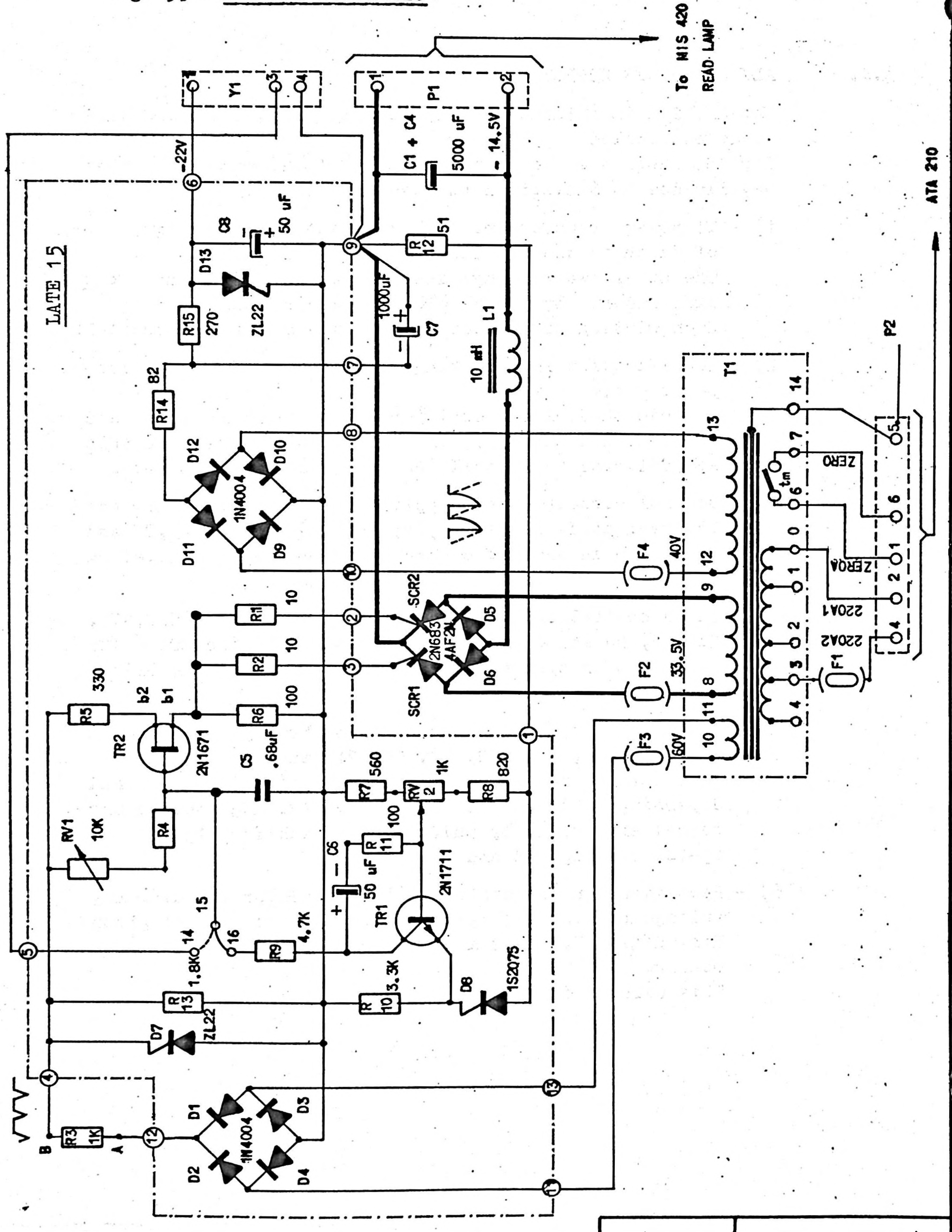


Fig. 54 - ALI 220 plan view

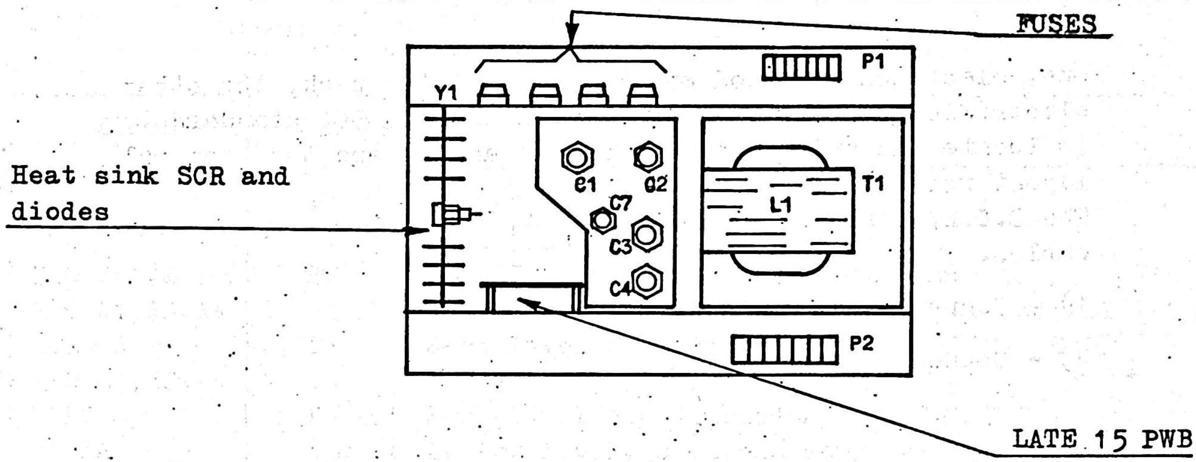
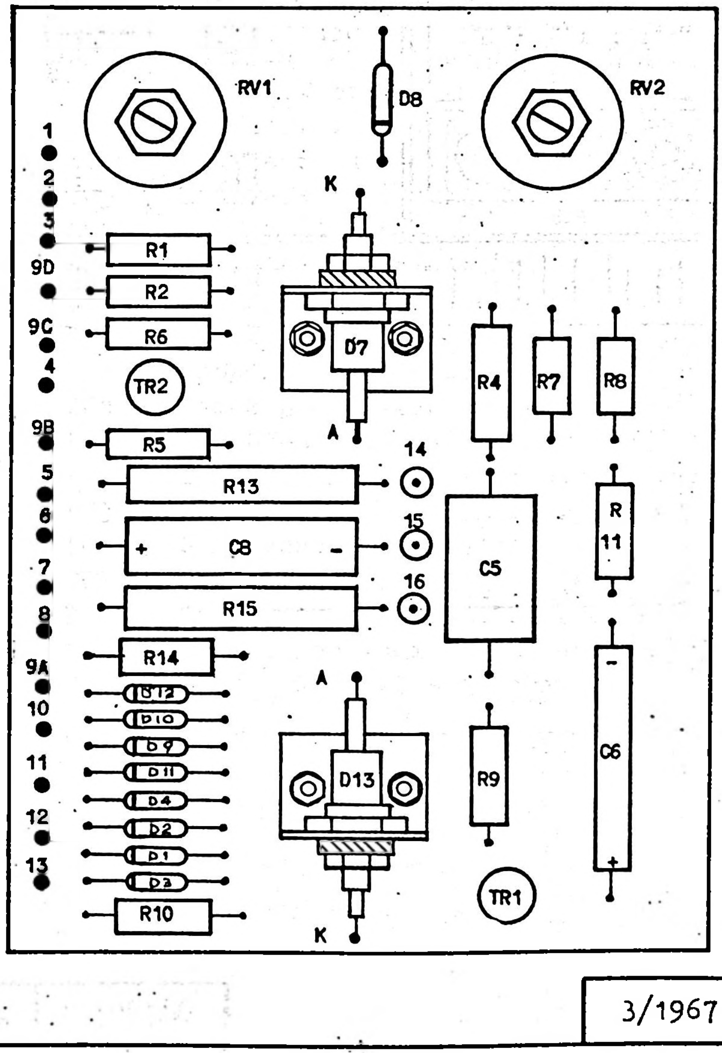


Fig. 55 - LATE 15 PWB layout



4.5. ATA 210 PACK

This unit is made up of two sub-assemblies.
One, electrical, fitted on the front of the pack, the other electronic, constructed adhering to the LTR 300 standards.
To locate the unit, refer to fig. 1 and to see the general layout refer to fig. 56.
The D.O.E. board is connected to the lower D row by two cables.

1) - Connector Y1 to D07

2) - Connector Y2 to D08.

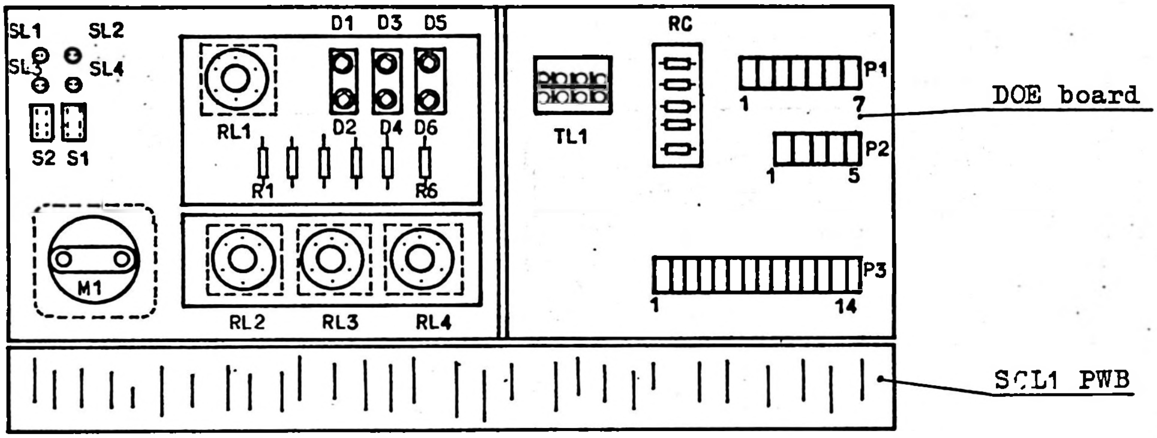


Fig. 56 - Wiring side view of ATA 210

All pertinent signalsare listed overleaf with their relative meanings.

SIGNAL	WHERE	WHAT
GEAL	P1	24 VAC signal for breaker supply.
+20T	P1	+ 20 V level conditioned by TL1.
220 X,Y,Z	P2	3 ∅ 220 VAC input on TL1 breaker.
220 A1,A2,A3	P3	3 ∅ line conditioned by TL1. Motor and ALI 220 power.
ZERO A	P3	Zero level conditioned by the ALI 220 TSW.
220 M1,M2,M3	P3	3 ∅ motor power supply.
ZERO M	P3	Zero level conditioned by ALI 220 TSW and motor.
COBIA	D04	At low level, commands card feed solenoid.
CEMA	D04	+ 5 V fixed level.
REMA	D04	Reset F.F. MAREA ATA 211.
SEMA	D04	Set F.F. MAREA ATA 211.
FOBUN	D04	Stacker photodiodes signal.
MOMO	D04	+ 5 V fixed level.
AUTO	D04	At high level reader in AUTO.
RIPEA	D04	Start of read signal.
REBU2	D04	RESET F.F. BURI ATA 210.
TECA1.	D04	Stackers full, hopper empty indication.
SEC01	D05	STAND-BY indication.
NORA	D05	MISFEED indication.
SEGEA	D05	READ-CHECK indication.
RITA1	D05	SELECT-ALERT indication.
RIFIN	D05	A low level, commands card reject solenoid.
MAVUN	D05	Hopper empty indication.
UNAT	D05	Track photodiode signal.
MARE2	D05	OUT-OF-SERVICE signal.
UNEPN	D05	Card transit under track photodiode.
PICA	D05	Stacker full indication.
EROS1	D06	Sync error indication.
EROF1	D06	Photoelectric error indication.
BURO1	D06	Signal for incident before read head.
BURI1	D06	Signal for incident after read head.
NOPE	D06	ERBU - ATA 210 - generation.

4.5.1. ATA 210 - electrical half

It comprises the motor remote command circuits, the various interlock relay and indicator lamps.
Following fig. 57 what said underneath will show:

1) - The 3 phase power supply goes directly to the fans (VAR 220).
TL1 and the D1 to D6 diode controlled circuit condition the motor supply.
TL1 also conditions the ALI 220 power supply.

2) - TL1 energizes when the ON pushbutton is depressed (BOTE1 signal) only if RL2 relay has already energized and its hold-on contact, 7-8 is held through the OFF pushbutton (BOTE2 signal).
TL1 de-energizes if OFF is depressed or if RL2 de-energizes.

3) - The power supply for the motor is achieved by the diode controlled circuit, piloted by RL1 relay. This relay remains energized only by the presence of signal MICA and the absence of BUREN, which is the JAM signal.
Switch S2 allows the removal of power manually from the motor.

4) - Relay RL3 energizes when ON is depressed (signal MICA). Its hold-on contact 6-8 keeps it energized as long as BUREN is not present RL3 gives console indication of "motor on" through contacts 1-3.

5) - Relay RL4, when de-energized, gives the OUT-OF-SERVICE indication (signal MARE on ATA 211). RL4 only energizes when, with sig. MICA present, pushbuttons OPERATE or MANUAL FEED are depressed.
Its hold-on is 1-3.

6) - The four indicator lamps on the maintenance console have the following meanings when lit:

1) - SL1 - signal BUPI - Jam after the read head.
2) - SL2 - signal BUCA - Jam before the read head.
3) - SL3 - signal LAFO - Photoelectric error EROF.
4) - SL4 - signal LASO - Sync error EROS.

7) - When switch S1 is made, it causes signal AUTO to go high and cards to be fed automatically.

Fig. 57 - ATA 210 schematic

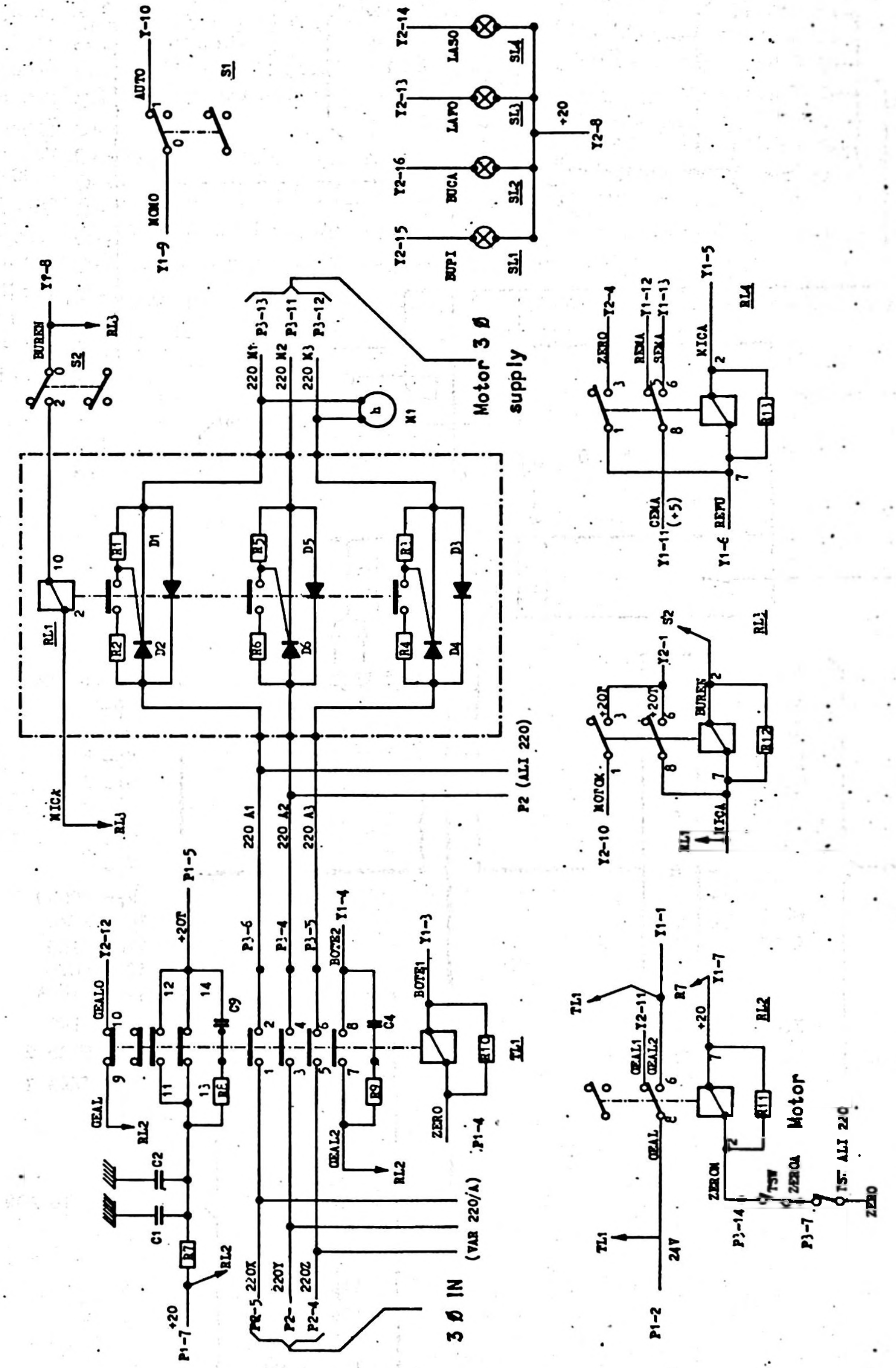
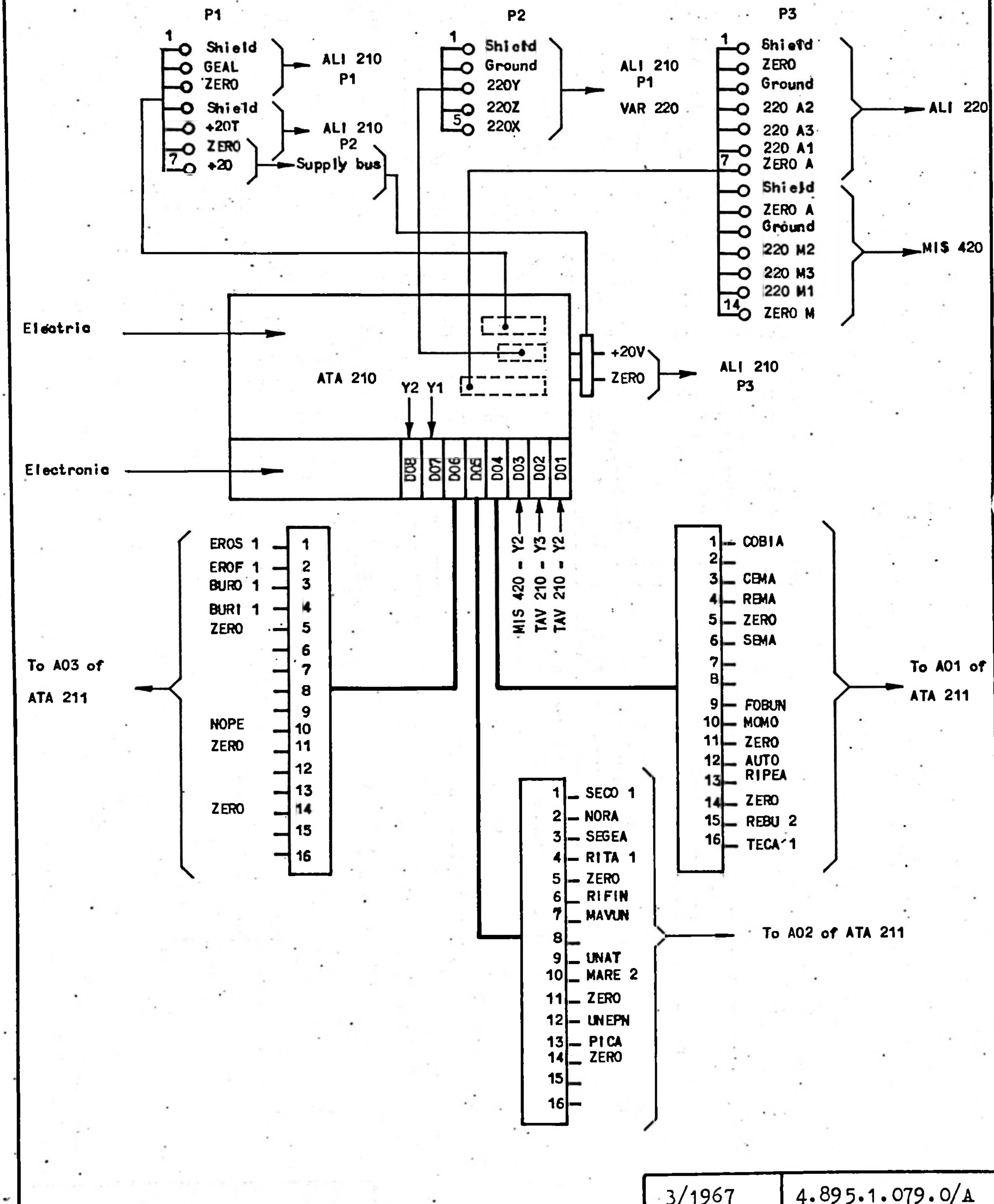


Fig. 58 - ATA 210 interconnecting cables



4.5.2. ATA 210 electronic half

The electronic half of the ATA 210 PWB comprises some regeneration, calibration and lamp amplifier circuits.
It also houses some of the logic circuit relative to jam control.
It is connected to the D.O.E.,to the ATA 211,to the TAV 210 and to the MIS 420 with cables and connectors.
Documentation relative to the subject is reproduced in the "Logic Block Diagrams" chapters 851 - 852 - 853.
The logic explanation of the jam circuit will be delt with during the description of the ATA 211.

4.6. ATA 211 PACK

The ATA 211 comprises the majority of the subsystem logic circuits. It is made up of a standard LTR 300 pack which may be located referring to Fig. 1. It is connected to other units by cables as shown in Fig. 74.
The following list of signals gives their logic meanings taken from the controller interface.
All logic explanations which follow are reproduced in the "Logic Block Diagrams" chapters 854 to 864.

SIGNAL	WHERE	WHAT
LE09 to LE12	C02	Read signals to the transcoder.
TILEN	C01	Read strobe to the controller.
TILIN	C01	Card feed signal from controller.
RIFAN	C01	Card reject signal from controller.
SESEN	C01	Put in "STAND-BY" signal from controller.
CAGU2	C01	Reset or clear signal from controller.
SEGE	C01	Error signal to controller.
MADIN	C01	Reader busy signal to controller.
FISE	C01	End of sequence signal to controller.
FINAN	C01	Read end signal with last character strobe.
MAREN	C01	Out of service signal to controller.
SECON	C01	Manual condition signal to controller.

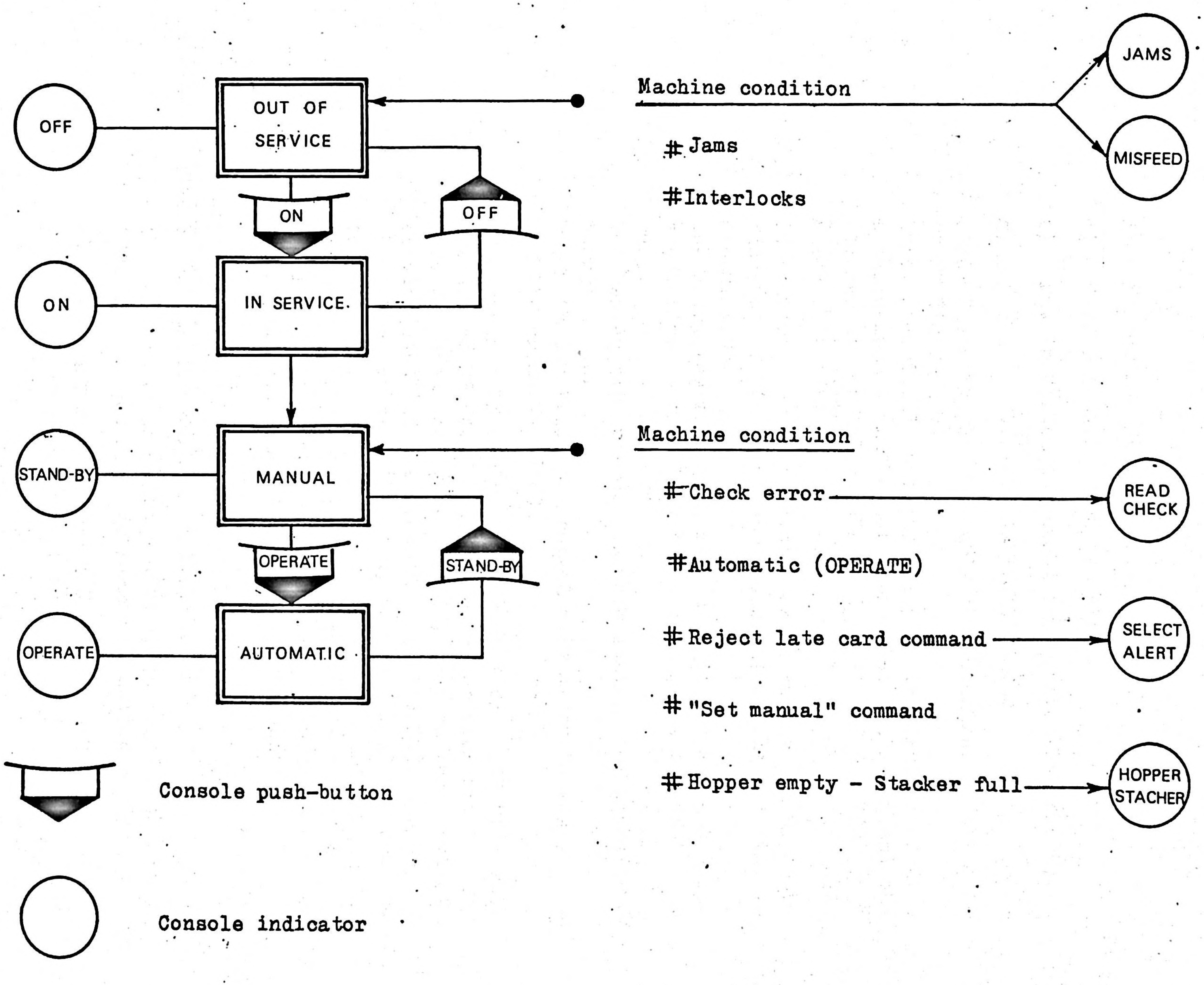
4.6.1. Machine logic states - chapter 861 - Fig. 59-A.

1) - The set of FF SECO determines the "Manual" or STAND-BY state.
Present at system switch ON.
May be entered into this state, from OPERATE, in the following conditions:

a) - Error signal with pushbutton STOP-REJECT on STOP.
(SEGEN ‾|_ . COSEN ‾|_|‾).

b) - Depression of STAND-BY (MASE1).

c) - Presence of the out-of-service condition (SALE).


OFF
OUT OF SERVICE
ON
OFF
ON
IN SERVICE.
STAND-BY
MANUAL
OPERATE
STAND-BY
OPERATE
AUTOMATIC
Machine condition
# Jams
#Interlocks
JAMS
MISFEED
Machine condition
# Check error
READ CHECK
#Automatic (OPERATE)
# Reject late card command
SELECT ALERT
# "Set manual" command
# Hopper empty - Stacker full
HOPPER STACHER
Console push-button
Console indicator

d) - Reader in OPERATE (AUTO).

e) - SELECT ALERT indicator (RITA).

f) - Put in STAND-BY command from controller (SESE).

g) - HOPPER empty; STACKER full (TECA).

2) - OPERATE State. This state is characterized by the reset of FF SECO.
This condition is achieved by pressing OPERATE if the machine is not in the out-of-service condition and the stacker is not full. (RESE ‾|_ = VIATN _|‾ ·MARE ‾|_|‾· PICAN ‾|_|‾·).

3) - The out of service condition is characterized by the reset of FF MAREA, which causes RL4 on the ATA 210 to de-energize.
The subsystem is put in such a condition at each and every time on interlock trips or a grave incident occurs.
The reader will also be in this state after pressing ON to switch on.
The MARE condition is removed only after having pressed OPERATE or MANUAL FEED.

4) - The reader will be "ready" (OPERATE or STAND-BY) with the set of FF MACON that occurs after each and every card has been read (signal FILE) or when the out-of-service condition is present (signal SALE).
The reader becomes "busy" by the card read command (signal TILI).
Chapther 861, furthermore, has the various signal regenerations for other signals and the formation of SEGE1, which is the OR of all error conditions.

4.6.2. Card feed and selection logic - chap. 856

1) - The command to the feed clutch is realized with signal COBIA low when in the following conditions:

a) - External command: when F.F. ALIM sets with signal TILI from the controller.

b) - Internal command: when COMA signal is present which defines the functioning in OPERATE (AUTO) and MANUAL FEED (VIDA).
These signals are operative if the functioning limitations are adhered to (NOR COMA:signals SESA, TECA, RELI and SECOA).
One shot RERI, when an out-of-service occurs (MARE) immediately after the command to the feed solenoid, allows the operation to be accomplished without imparing the condition of the mechanical part. It furthermore puts some control FF.s in their start state.

2) - The command to the mechanical deflector solenoid is effected by RIFIN when low and in the following conditions:

a) - for internal error conditiond (SEGEN low) when REJECT for error is positioned (COSE 1 low).

b) - For external command card reject (RIFAN low) provening from the controller. This command is only effective if it reaches on time, this means before the card obscures the track photodiode (reset FF BAMO). If the command reaches with a delay, (RIFAN ‾|_|‾ • BAMON _|‾|_) the deflector in not energized, but FF RITA sets (RISE ‾|_ • BAMO ‾|_|‾).
This causes the subsystem to go in STAND-BY and gives the SELECT ALERT indication.
It is to be noted that the command for the mechanical deflector is strobed by the card passing under the track photodiode (signal UNATA ‾|_) input on one shot RIFI.

3) - FF BAMO sets at card read end (FILE) and resets when the card goes under the stacker photodiode (UNEP1).
The start of work reset is achieved with the start reading card signal RIPE1.

4) - FF CORI sets when the cards reject command is accepted (RICO) and resets when the card goes under the track photodiode (UNEP1).
The start of work reset is done with RIPE1.

5) - FF RITA sets when the reader goes in OPERATE (automatic) (signal VIATN ¯|_). It is kept in the reset condition by RIFI in the eventuality of it resetting even if the deflector had operated.
Signal SALE maintains FF RITA in reset at start of work.

6) - FF CADI sets at the start of a feed cycle (RERI) and reset when the leading edge of the card enters the read station (AL04 N).

7) - FF BUDI sets if a jam occurs during a read cycle (PAREN ¯|_ • MACON ¯|_|¯).Reset with the CLEAR signal REGE.

8) - When signal NORA is high (CADIN ¯|_|¯ • BUDIN ¯|_|¯) the MISFEED indicator lights.

9) - FF ALIM is sistematically reset at every card read start (RIPE).
In the eventuality of out-of-service, it is maintained permanently in reset by signal RELI high.

10) - FF TECA indicates STACKER full and HOPPER empty.
Sets with signals TESA and PIRI respectively for the above conditions.
Reset is achieved by pressing OPERATE or MANUAL FEED if the setting cause has been removed.
FF TECA is resetted by REBU1 at switch on.

11) - FF:s VIAT and VIDA reproduce respectively the functions of OPERATE and MANUAL FEED pushbuttons.

4.6.3. Timing circuits - chap. 854 - 855

The passage of a card under the read head is checked by circuits that establish the start and end of the card, the start of the first and last column, count and subdivide the punched columns.
The thing that achieves all this is the sync photodisc, which emits 16 impulses for each step of the card (read column).
The relative signal, TICI is squared up.

1) - The entry of the card under the read head set FF SESA (AL03 to 04 ‾|_ • CADIN ‾|_|‾). SESA remains set for the whole transit duration of the card under the head. It resets when the card goes out (FILE ‾|_).

2) - One-shot RIPE is triggered by FF SESA and phases in the step counter IMOA to IMOD with the appropriate read column.
Its nominal duration is 270 /usecs. and is adjusted at the manufacturers. See fig. 59.

3) - The step counter consists of 4 FF.s IMO A, B, C and D connected in such a way to achieve a binary count up to 16.
The counter is maintained zeroed by signals SESEN and RIPE 1. When RIPE 1 falls, it begins to count the negative fronts of signal TICO (conditioned sync disc signal) 16 TICO pulses correspond to one card column and therefore, the exploration of one column is one complete evolution of the step counter. See fig. 59.

4) - The counter for the number of steps is made up of 7 FF from TA01 to TA07 connected in such a way to achieve a binary count up to 127 (useful count is only up to 85).
This counter counts the steps or the columns into which the card is divided.
Signals RECO and RELU put the counter at 1 if the card has 80 columns and at 30 if it has 51. See fig. 60.
It is 0ed by signal SESAB an RIPE 1.

5) - FF PESA is setted and resetted by the FF TAOX decodes. It spans exactly both 51 and 80 read columns. It is initially resetted by signal RIPE.

6) - Signal SISON loads what has been read in FF.s LEXX1. See fig. 61, chap. 860.

7) - Signal RE1F1 zeros FF.s LEXX1. Fig. 61.

8) - Signal TILEN forms the read strobe on the controller. Fig. 61.

The sync existing between card and counter may get cut of step during read. This may be caused by card slippage on the track rollers.

Fig. 59 - Read start timings

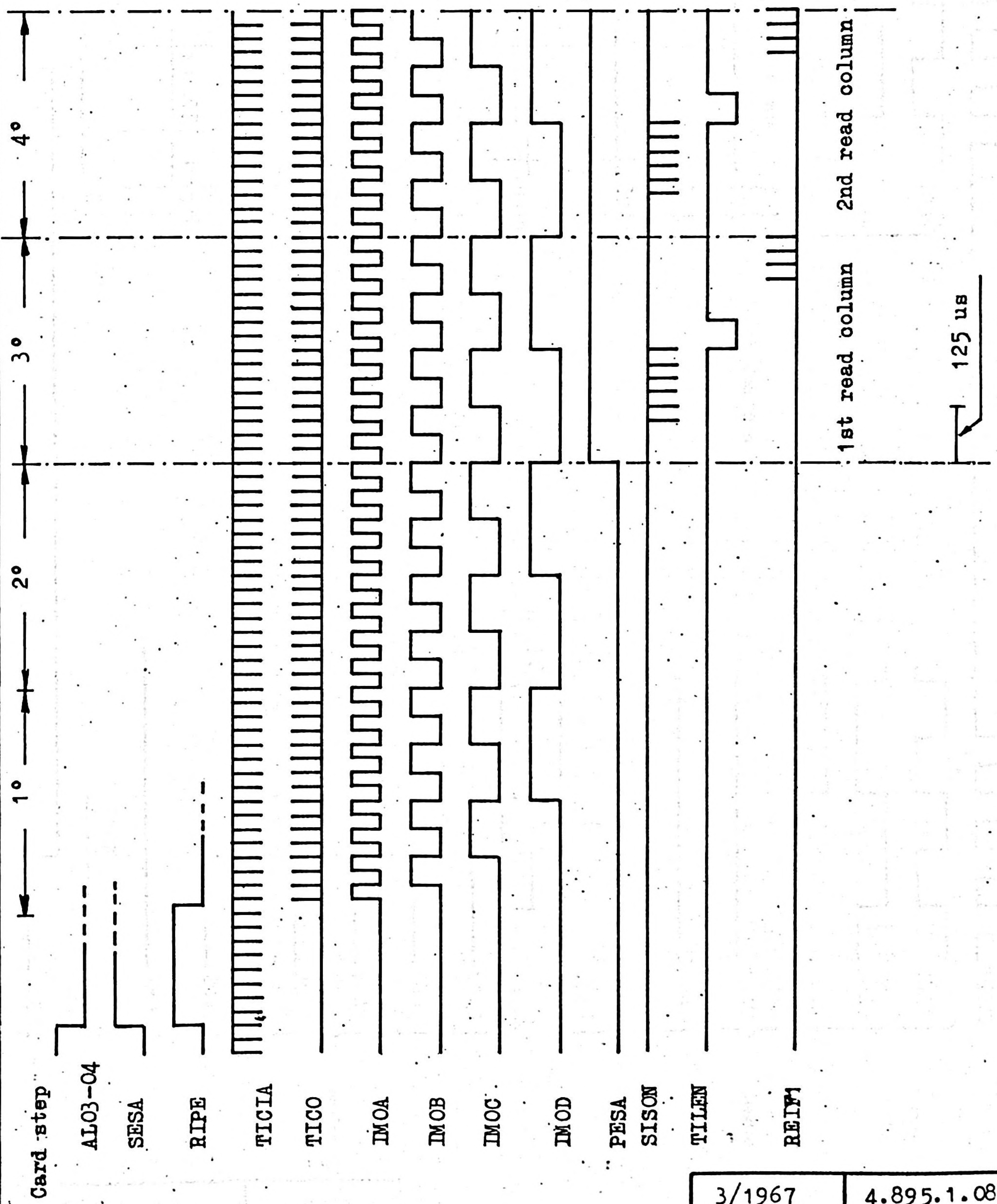
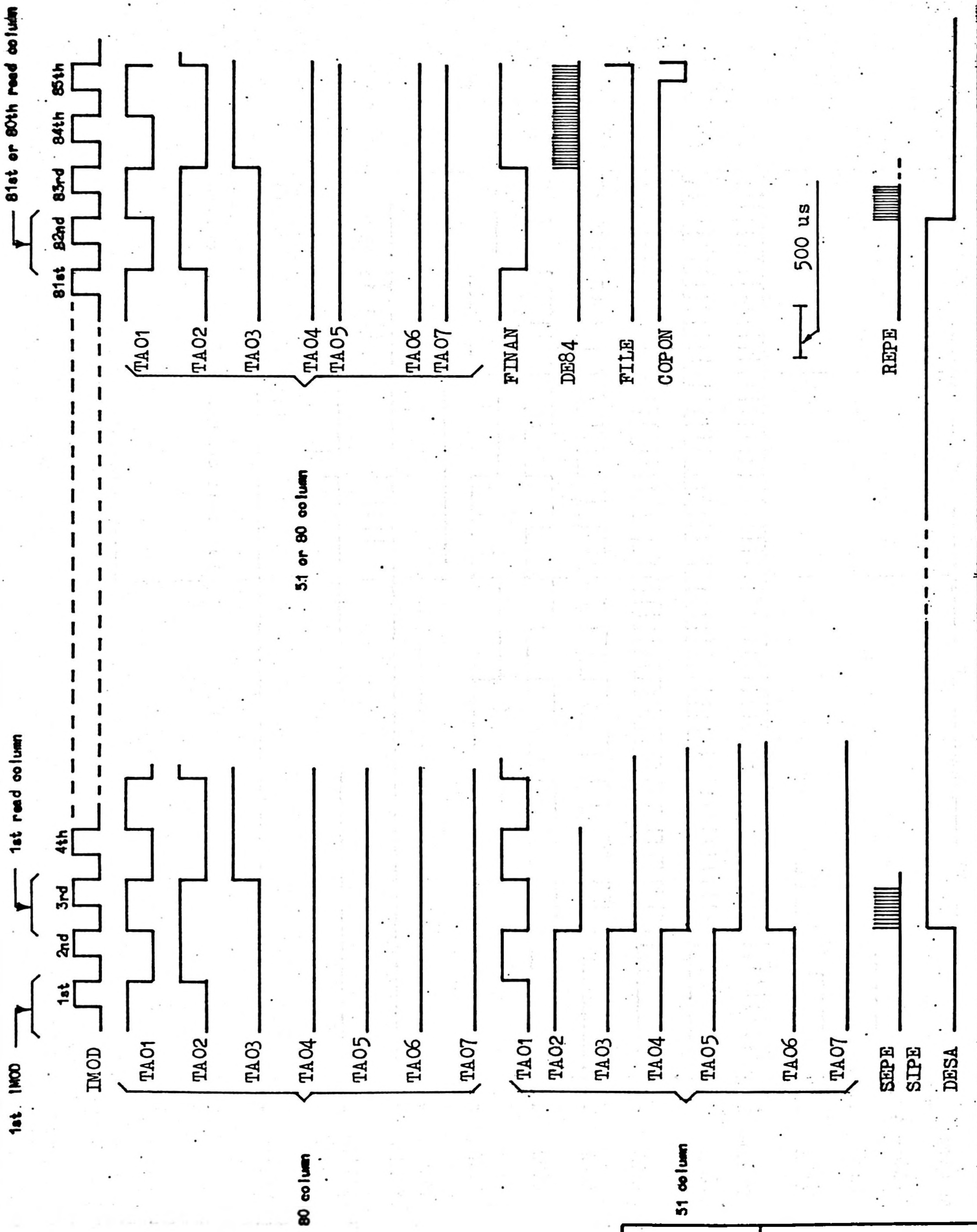


Fig. 60 - Read cycle timings



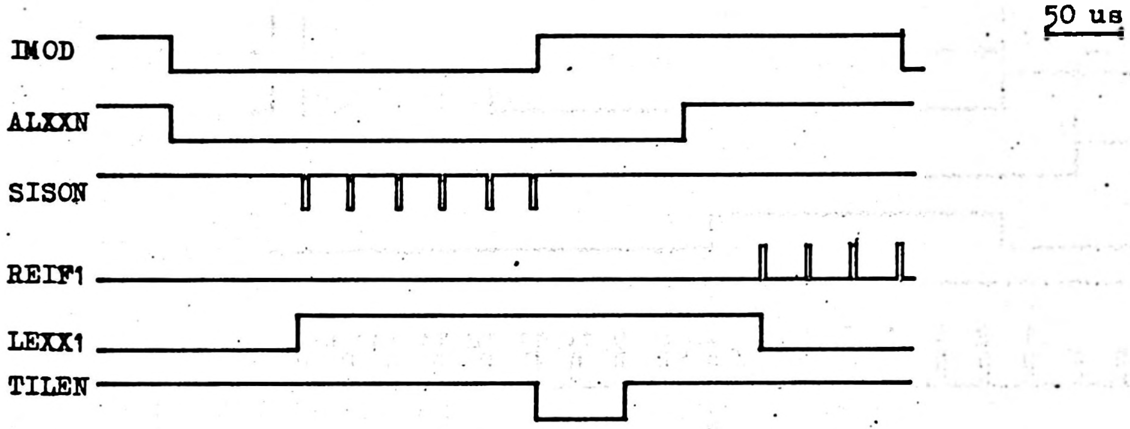


Fig. 61 - Loading of one column and strobe

For this reason an auto-sync circuit is provided to allow a max slippage of ± 250 µsecs. between one read and another.

1) - FF MECO sets when the card is late with respect to the step counter (PEFO ‾|_ . MARAN ‾|_|‾). This is done to inhibit the count of one TICO, so that full sync may be once more established. See fig. 62.

2) - One shot COPI triggers when the moving card is leading the normal evolution of the counter (MARAN ‾|_ . PEFO ‾|_|‾).
This causes a + 1 count on the step counter and therefore evens out its delay with respect to the card. See fig. 63.

3) - FF CERO inhibits the + 1 count,if it happened wrongfully after a - 1 count, in the event of a card being more than 180 µsecs. with respect to the evolution of the step counter. See fig. 64.

Fig. 62 - Card lagging - one TICO inhibited

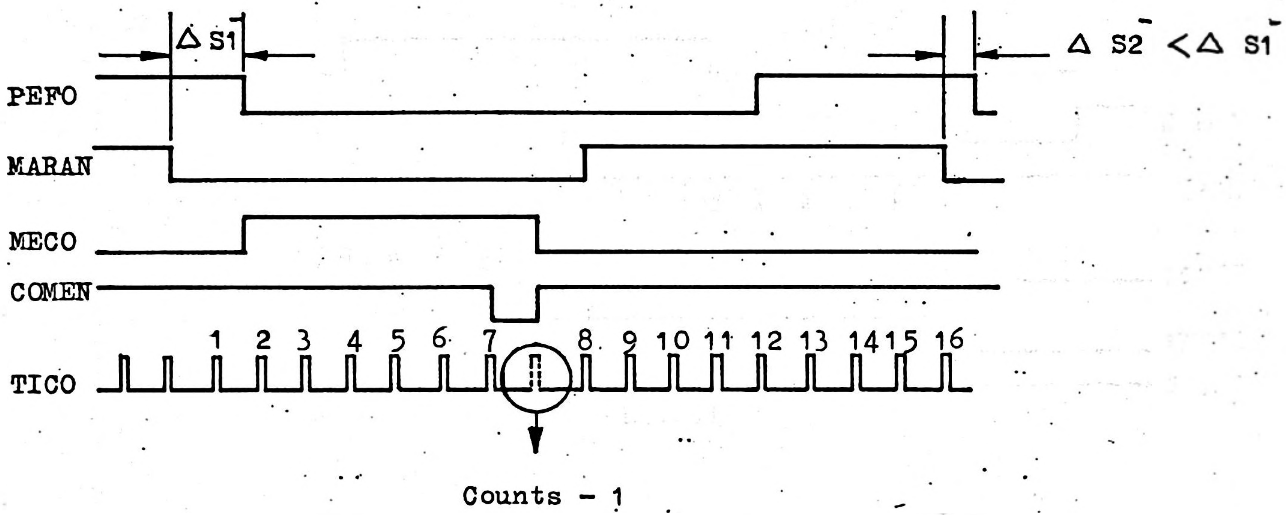


Fig. 63 - Card leading - + 1 forced

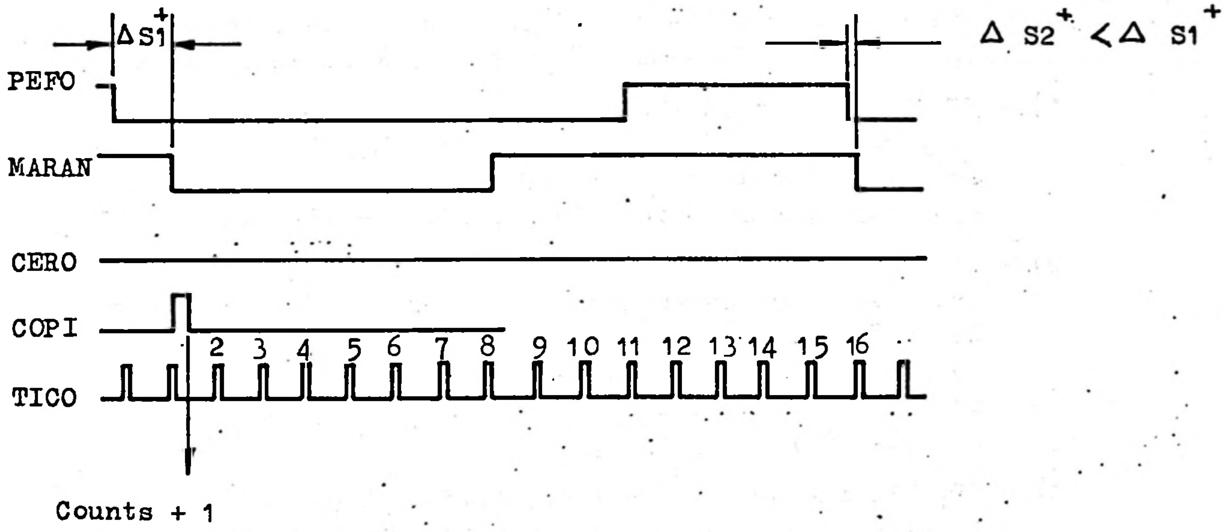
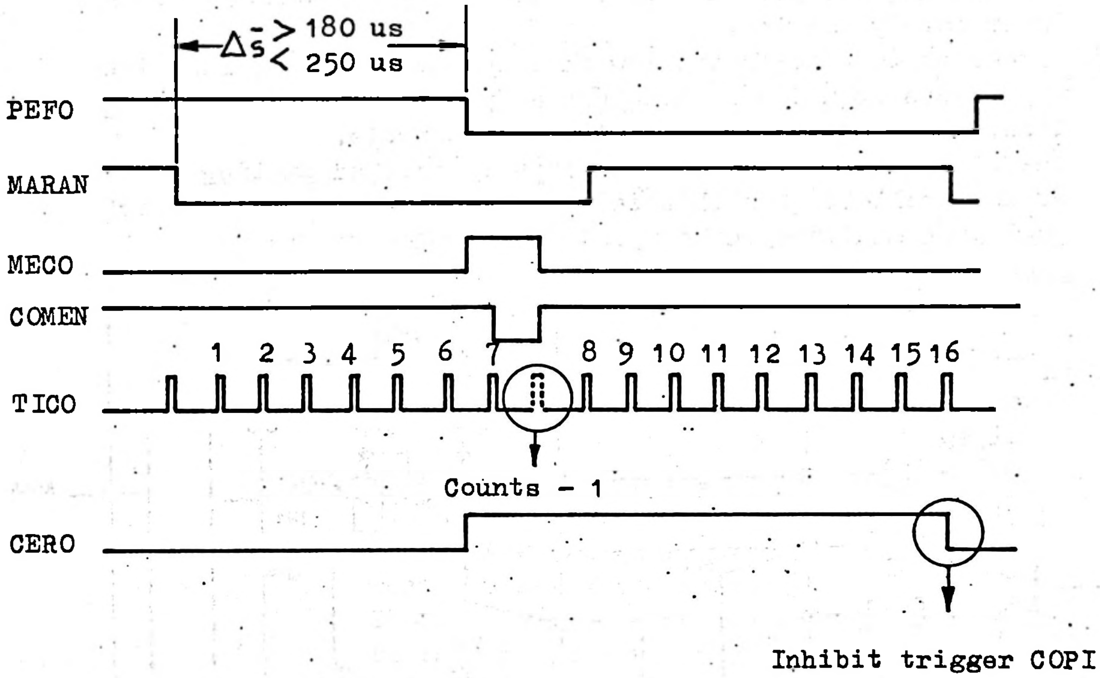
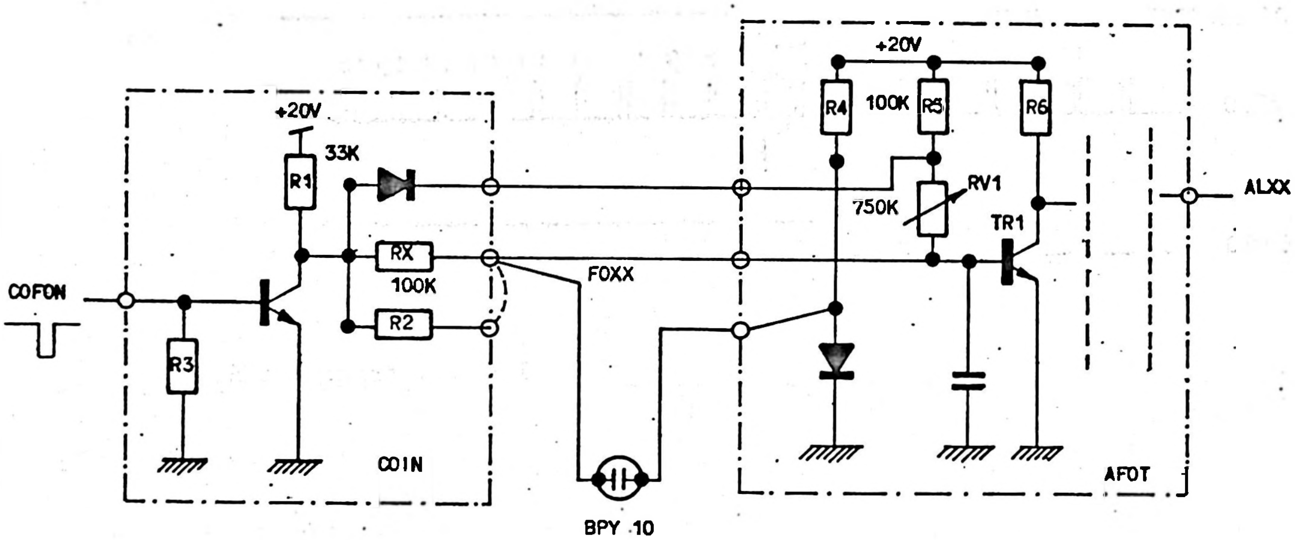


Fig. 64 - + 1 count inhibit when delay > 180 usec



4.6.4. Read logic - chap. 859 - 860

The read head signals, relative to each of the 12 rows of the card, are F001 to F012. These are fed to 12 AFOT amplifiers.which give an output signal of 350 μsec duration which is in sync with the perforations read. These signals are loaded in FF.s LE011 to LE121 by signal SISON; their reset is effected by REIF1. See fig. 61.
Between each card feed a photocell check is carried out by the COIN circuit as shown in fig. 65.
The COIN circuit connected to the AFOT amps, acts on them only during the presence of low COFON signal, which decreases their safety margins.
If one or more cells are low in sensitivity, their relative amplifiers do not switch on and a "photoelectric error" indication comes up on the maintenance console.
The efficiency of the COIN circuit is checked putting R and R2 in parallel. When this is done the "photoelectric error" must systematically come up.



Note:

1) - During normal functioning the first stage of AFOT (TR1) is cut-off when the photocell is lit.

2) - The resistance RX is 820 K ohm for cells with sensitivity of 80 to 120 μA and 1.5 M ohm for those with 40 to 80 μA.

Fig. 65 - Connection of COIN to AFOT

4.6.5. Card progress control - chap. 857, 858 and 851 of ATA 210

The progress of the card along the track is controlled by a group of circuits that modify the operation of the card feed and selection circuits. They also cause console indications in the eventuality of a malfunction.
During the read phase two error check are envisaged:

1) - Photoelectric error check (EROF).

This occurs when one or more read head photodiodes do not function correctly (either low emission or short circuit).

a) - FF COBU, resetted at the start of each feed cycle by signal RERI. It sets when the card enters the read station with signal PEFO.
PEFO goes high when all the photodiodes are in darkness and none are in short circuit.

b) - Signal LUORN is low when all the photodiodes are lit only if none are open circuited or have scarce emission (check carried out by COIN).

c) - Signal ABER is low when the subsystem is in AUTO or when reading commanded by the controller (signal MACO).

d) - FF EROF sets with the last counting TICIA if FF has not setted, or if signal LUORN is high.
A high ARBER signal, prevents the setting of EROF when cards are fed manually.
It must be remembered that during the last count TICIA, the card has already left the read station and, therefore all the photodiodes are exposed to light.

2) - Sync error check (EROS)

If the slippage of the card with respect to the step counter is greater than ± 180 µsec a sync error indication is given.

a) - FF EROS sets if signals SERE or SERA are present.

b) - Signal SERE is generated during the counting of the 34th step if the card has a lead superior to 180 µsecs to the normal.

c) – Signal SERA is generated during the counting of the 85th step if the card has a lag superior to 180 usecs to the normal.

Error signals EROF and EROS are resetted at the start of each read cycle by RIPE 1 and by CLEAR signal REGE which also reset their respective loader flip-flop.

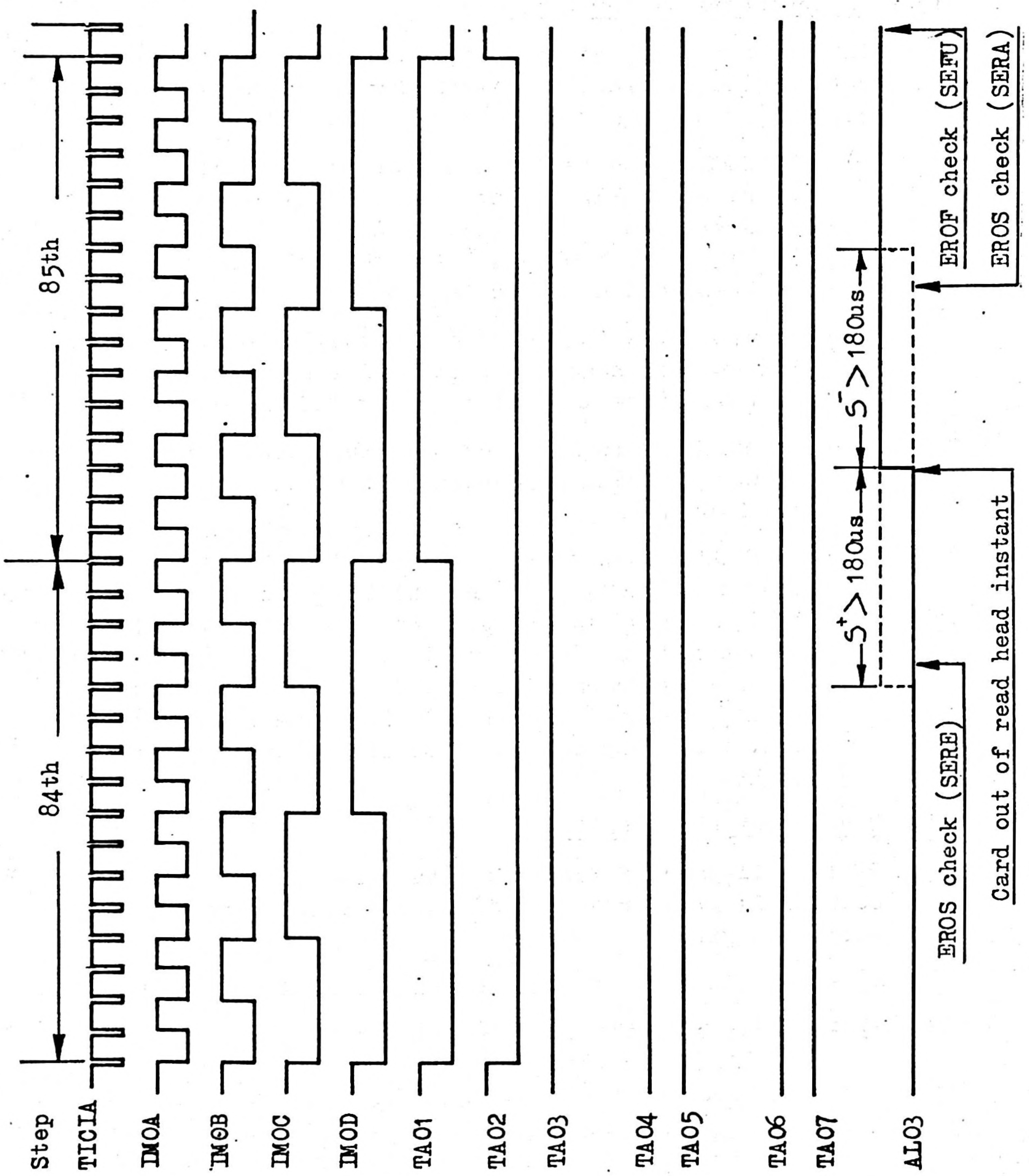


Fig. 36 – Error condition check w/f.

During the transfer of the card from the hopper to the stacker checks are carried out to determine any jams along the track.
These check may be divided in two groups:

a) - From the hopper to the read head.

b) - From the read to the stackers.

The theoretical card transit times that the card must adhere to are illustrated in figs. 41 and 42.

1) - FF BURO sets when a jam occurs any where between the feed hopper and the read head.

a) - Signal MALAN indicates a jam in the throat after the 3rd attempt has been made to pick the card from the hopper.

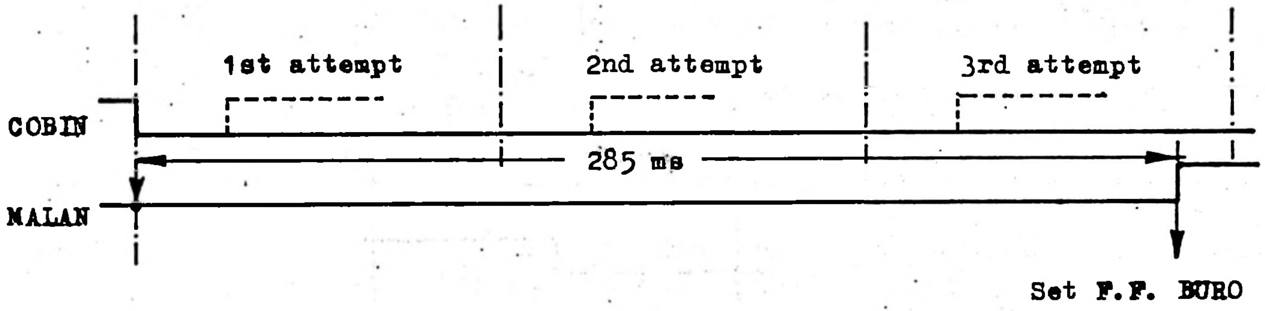


Fig. 67 - Card jam in throat

b) - Signal MACAN is generated 80 msecs after a card feed command has been not satisfied. This condition arises if a card jams in the hopper itself.

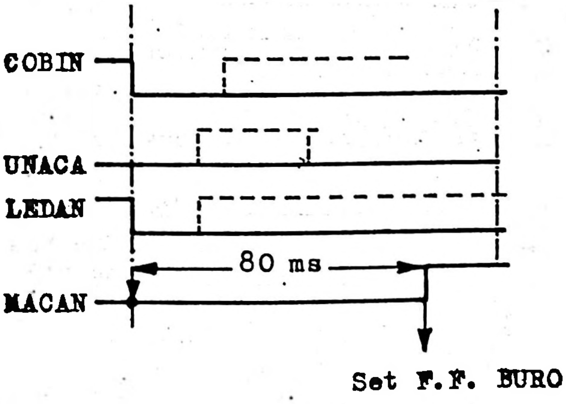


Fig. 68 - Card jam in hopper

c) - FF BURO sets, furthermore, if the card reaches the read head late (PISEL ¯|_ · SESA ¯|_|¯) and if the card leaves the hopper out of sequence (RIPE 1 ¯|_ · PISE ¯|_|¯).See figs. 69 and 70.

d) - FF BURO resets with signal REBU 1 generated by pressing the ON pushbutton on re-lighting the machine.

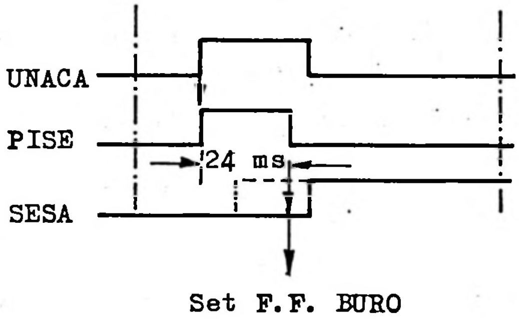


Fig. 69 - Card late or missing

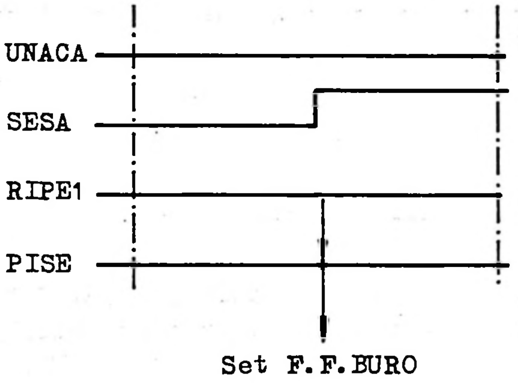


Fig. 70 - Card departs out of sequence

2) - FF BURI sets when a jam occurs anywhere between the read head and the stackers.

a) - FF MANE normally remains in set from the instant the card passes under the track control photodiode FOTA, to that time when the same card is under one or the other of the stacker photodiodes, FOBU.

b) - The sum of the times of one shots UNIB and UNOB covers the card transit time from the read head (signal RIPE) to the track photodiode (signal UNAT) with a tolerance of + 12 msecs. If the UNIB and UNOB time is surpassed, FF BURI sets, indicating, therefore, that the card has not yet reached the track control photodiode FOTA. See Fig. 71.

c) - The sum of the times of one shots UNEP and UNAP covers, with a minimum of about + 15 msecs, the time taken for the card to transit from the track photodiode (set of FF MAME) to the stacker photodiodes (reset of FF MAME).
Signal BURI (JAM) arises if, after the sum of one shots UNEP and UNAP, the card has not reached the two stackers photodiodes.
See Fig. 72.

d) - The sum of the times of one shots UNIP and UNOP, with an extra 8 msecs, covers the card transit time under the stacker photodiode FOBU.
FF BURI sets when, through a jam or a delay, the card does not reach its destination and one shots UNOP falls. See Fig. 73.

e) - FF BURI is resetted by signal REBU2, generated by pressing the ON pushbutton on relighting the machine.

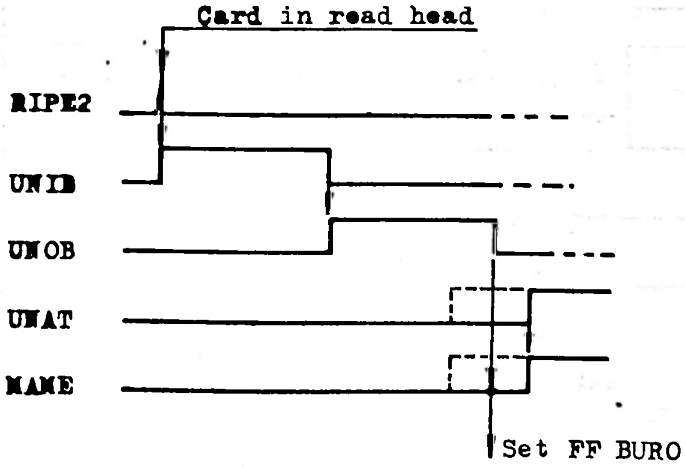


Fig. 71 - Card slow or jam from read head to FOTA

Fig. 72 - Card slow or jam from FOTA to FOSU

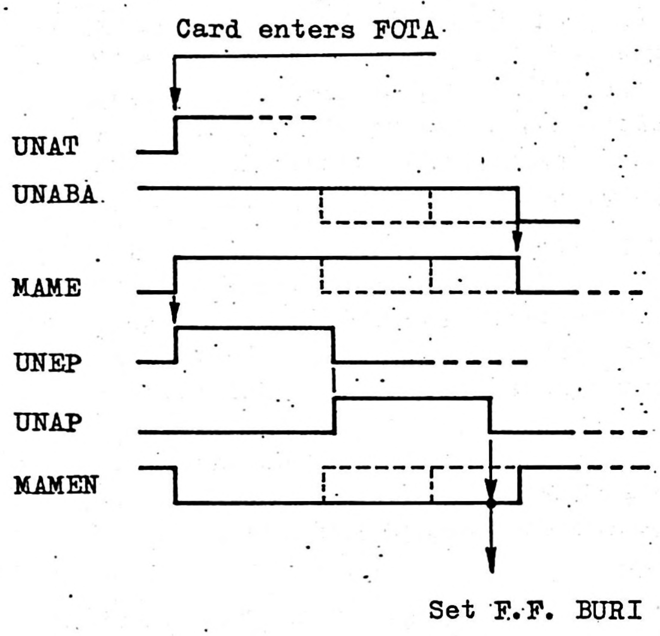


Fig. 73 - Card slow or jam during transit under FOCA

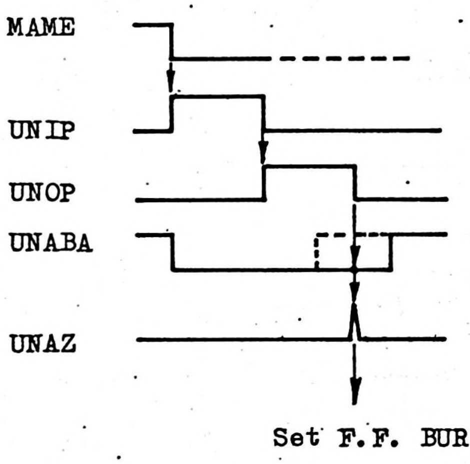
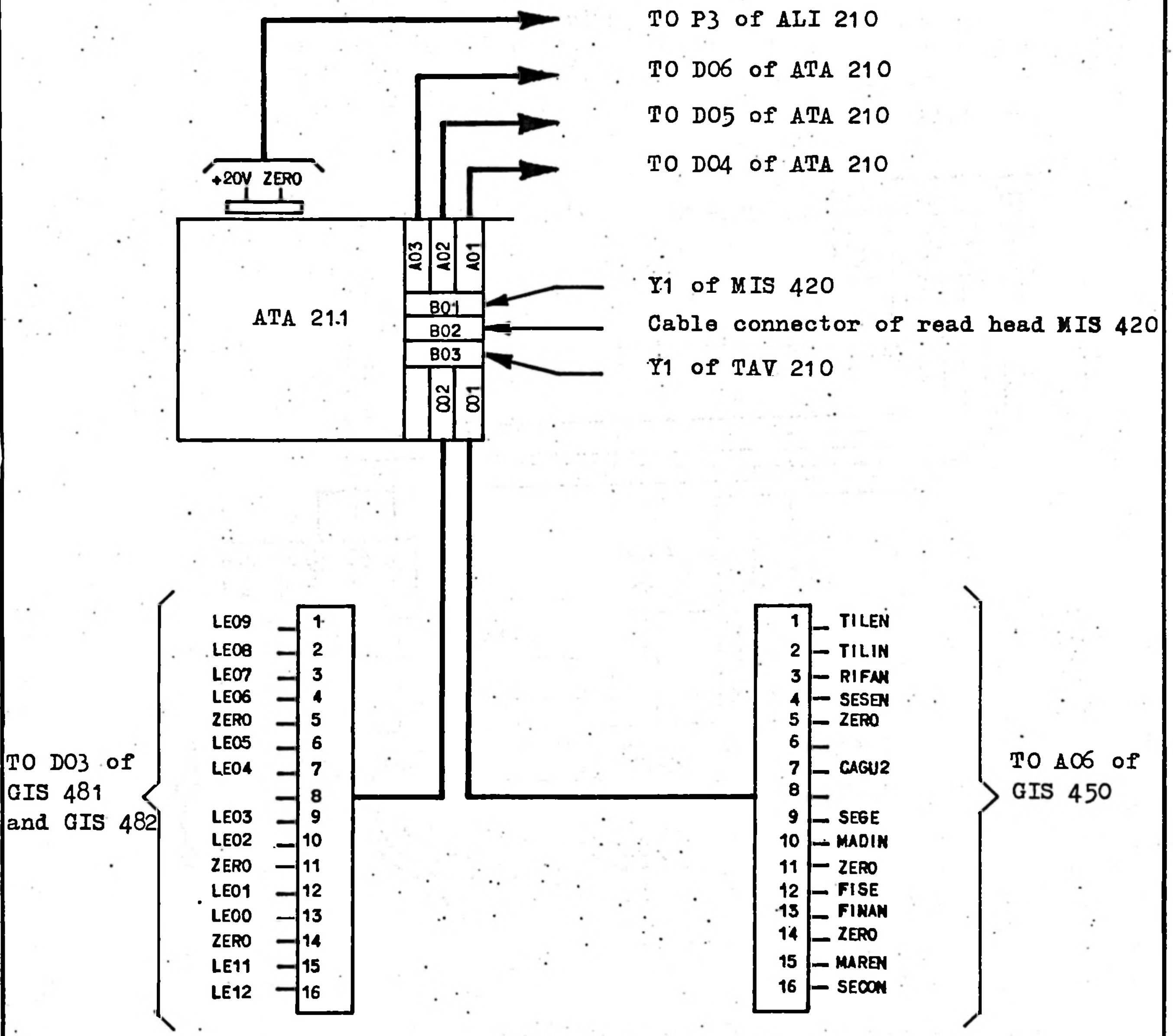


Fig. 74 - ATA 211 connecting cables



4.7. VAR 220 - FAN UNIT

The subsystem is ventilated by two VAR 220 fan units each having 4 fans.
Although the motors are single phase, they are connected to a 3 phase supply as shown in the figure below.

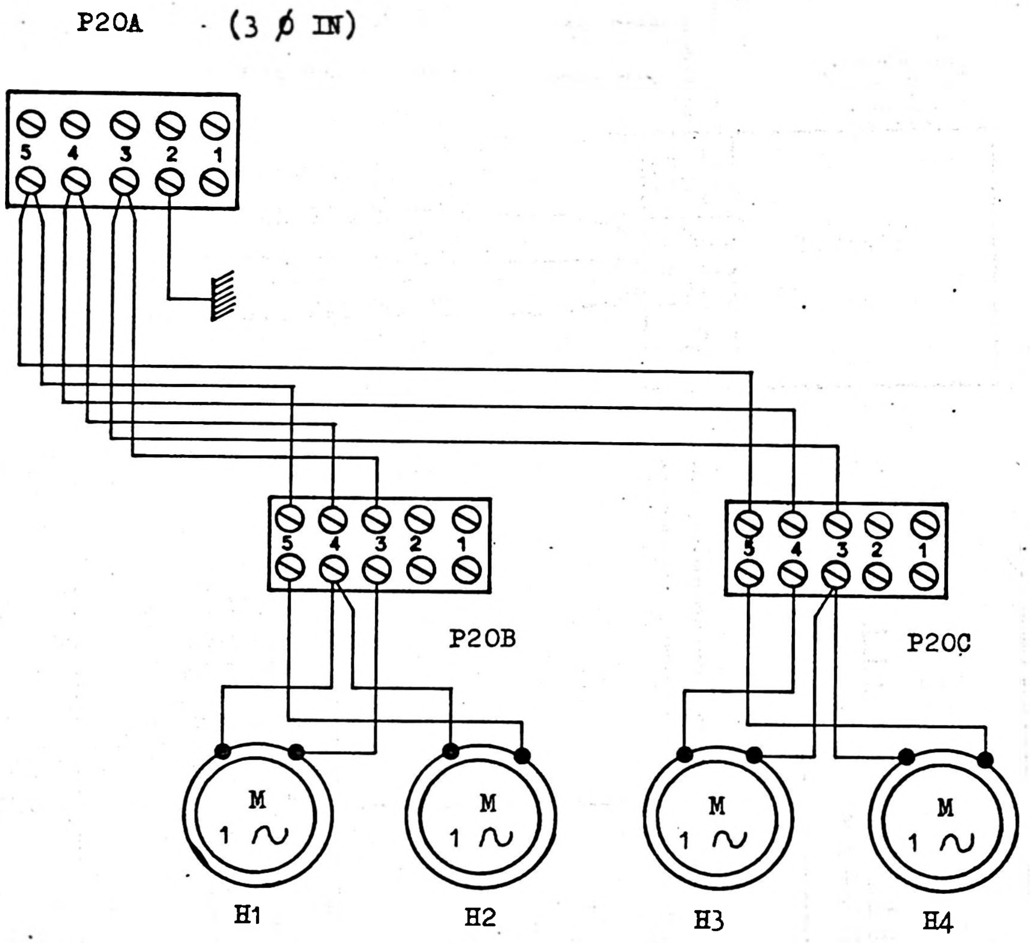


Fig. 75 - VAR 220 interconnections

4.8. 50 - 60 CPS MODEL DIFFERENCES

To adapt the system to the specific mains supply frequency there is the need to shift only a few connections on the ALI 210 and ALI 220 and changing a couple of component on the ATA 210.
The following tables which, visualize the changes necessary to each unit add and complete those mechanical changes described at para. 2.7.

a) - ALI 210 : move transformer primary connections.

Power Supply	shift connections
220 V, 50 cps	1 - 3
208 V, 60 cps	1 - 2

b) - ALI 220 : move transformer primary connections.

Power Supply	Trasf. connections
220 V, 50 cps	0 - 3
208 V, 60 cps	0 - 2

c) - ATA 210 : Substitute Main Breaker and Elapsed Time Counter.

5. CONTROLLER

5.1. GENERAL

For controller, for the LS 600 card reader, it is meant the interconnection of two elementary units, GIS 450 and GIS 481 / GIS 482 to achieve unity between Mechanics D.O.E. and the Central Processing Unit of the system to which it is connected.

A complete picture of their location and disposition may be got from fig. 1.

The individual units and their operations are described in the following chapters.

5.2. GIS 450 PACK

The GIS 450 is the proper controller for the subsystem. It is integrated for connection to the integrated channel of the GE 115 CPU.
Other types of controllers are foreseen for the connection of the subsystem to other systems.
The GIS 450 receives from the CPU all the commands sent to the subsystem transcoding then for the D.O.E.
It includes the timing circuits for data exchange, the transcoding logic for mixed mode reading and circuits relative to the exchange of logic conditions.
It is constructed with Standard LTR 300 and is housed in one row.
It is connected with cables to the CPU, to the ATA 211 and to the GIS 481/GIS 481. Fig. 76 gives the interconnections.
Some signals assume different names when exchange between elementary units. Table 1 gives this transcoding.
Reference documentation is reproduced in chapters 1250 to 1253 "Logic Block diagrams".

GIS 450	ATA 210
LUREN	SEGE
FIDEN	FISEN
LENON	SECON

GIS 450	UCE 430
ZERO	LUMAN
ZERO	LESAN

Table 1 - Signal transcode

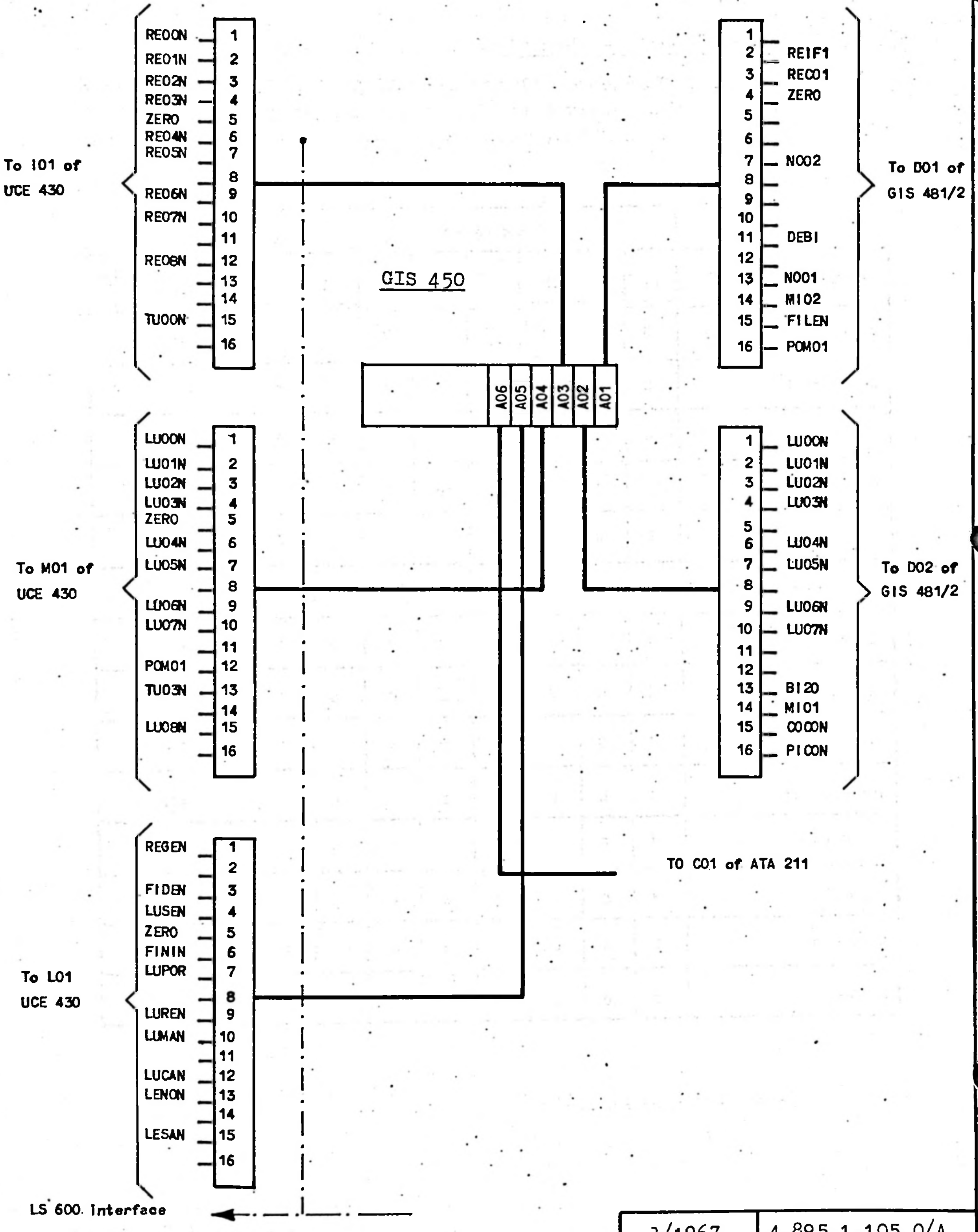
5.2.1. Command decode - chap 1250

The GIS 450 accepts all commands listed in Table 2. All these commands are received by the controller as combinations of interface bits REXXN, accompanied by selection clock TUOON.

	Coding bit								
COMMAND	07	06	05	04	03	02	01	00	HEXAdecimal value (character X)
Read in unchanged way	0	1	0	0	0	0	0	0	4/0
Read Normal I	0	0	1	0	0	0	0	1	2/1
Read Normal II	0	0	0	0	0	0	0	1	0/1
Read Mixed I	0	0	1	0	0	1	0	0	2/4
Read Mixed II	0	0	0	0	0	1	0	0	0/4
Read Binary	0	0	1	0	0	0	0	0	2/0
Put Normal I	1	0	1	0	0	0	0	1	A/1
Put Normal II	1	0	0	0	0	0	0	1	8/1
Put Mixed I	1	0	1	0	0	1	0	0	A/4
Put Mixed II	1	0	0	0	0	1	0	0	8/4
Put Binary	1	0	1	0	0	0	0	0	A/0
Put Manual	1	0	1	0	1	1	0	0	A/C
Card Reject	0	1	0	0	1	0	0	0	4/8
No Function	0	0	0	0	1	1	0	0	0/C

Table 2 - Commands list

Fig. 76 - GIS 450 cables connections



A partial decode is effected, by the GIS 450, of bits REXXN, to make each command received assume a logic signal meaning.

1) - Signal N001 : Generated when the controller receives a read command or preparation to Normal I mode.

2) - Signal N002 : Generated when the controller receives a read command or preparation to Normal II mode.

3) - Signal DEBI : Generated when the controller receives a read command or preparation to Binary mode.

4) - Signal MI01 : Generated when the controller receives a read command or preparation to Mixed I mode.

5) - Signal MI02 : Generated when the controller receives a read command or preparation to Mixed II mode.

6) - Signal SESE : Generated when the controller receives a Put in Manual command.

7) - Signal RIFE : Generated when the controller receives a Card reject command.

Signals at step 1, 2, 3, 4 and 5 establish the functioning mode of the attached transcoder. Depending upon the type of transcoder these signals may be not utilized in full or even identified. E.G. in GIS 481/2, N001 $\equiv$ N002 and MI01 $\equiv$ MI02.
Signals at step 6 and 7 act directly on the D.O.E. causing their respective functions.
The card feed command and the actual reading of the card is achieved by sending clock TU03N by the CPU.

5.2.2. Mixed mode read logic, timing and conditions - chap 1251

1) - Clock TU03N, from the CPU, causes card feed. It is only present when read commands are sent (unaltered,normal, binary and mixed).
After regeneration it is called TILIN and as such it is sent to the D.O.E.

2) - Read strobe TILEN, from the D.O.E., is regenerated as REIFA, triggers one-shot RITA that, on the negative front of the emitted signal, generates clock LU08.
This clock, is emitted, in pairs, at every read column read when the card is read in binary mode. Under these circumstances, at every column, are associated two characters transferred to the CPU and signal BI201. This signal, which comes from the transcoder, causes the generation of the second clock LU08, approx 15 /usecs after the first.

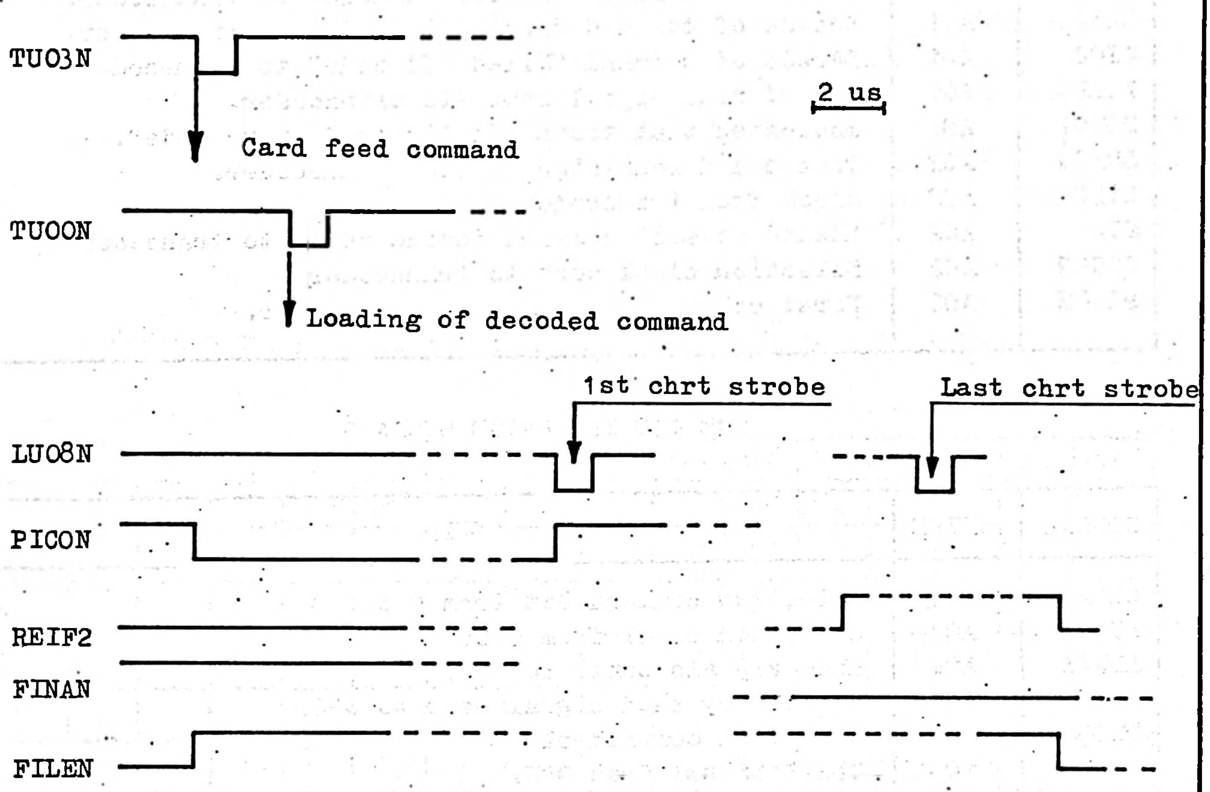
3) - Signal LU08N is the accompany clock of a character towards the CPU. It is formed by clock LU08 and kept permanently low whenever the reader goes in the out-of-service condition (MARE 1).

4) - The read end signal FININ, sent to the CPU, has meaning, when low, during last character transfer. It is formed by signal FINAN, conditioned by signal BI20,(presence of last character) which comes from the D.O.E.

5) - FF FILE remains in set from the moment the last character is transferred.
(REIF2 ‾|_ · FINAN ‾|_|‾) to the moment a new TILI card feed command arrives. The relative signal is used on the transcoder.

6) - FF PICO remains in set from the moment the feed command is sent to the reading of the first card character.
The relative signal is used on the transcoder.

Fig. 77 - GIS 450 signal timings



SIGNAL	WHERE	WHAT
REIF1	A01	Read strobe sent to transcoder.
REC01	A01	Clear signal from CPU to transcoder.
NO02	A01	Decode of command "Normal II mode" to transcoder.
NO01	A01	Decode of command "Normal I mode" to transcoder.
DEBI	A01	Decode of command "Binary mode" to transcoder.
MI02	A01	Decode of command "Mixed II mode" to transcoder.
FILEN	A01	End of read signal sent to transcoder.
PCM01	A01	Indicates that transcoder is in "Binary mode".
LUXXN	A02	Transcoded read signals from transcoder.
BI20	A02	Clock from transcoder during "Binary read".
MI01	A02	"Mixed mode I" command decode sent to transcoder.
COCON	A02	Selection clock sent to transcoder.
PICON	A02	First column check sent to transcoder.

UCE 430 INTERFACE SIGNALS

SIGNAL	WHERE	WHAT
REXXN	A03	Selection command bit from CPU.
TUOON	A03	Selection clock from CPU.
LUXXN	A04	Read signals sent to CPU.
PCM01	A04	Set binary read signal sent to CPU.
TU03N	A04	Card feed command clock from CPU.
REGEN	105	CLEAR signal from CPU.
FIDEN	A05	"End-of-sequence" signal sent to CPU.
LUSEN	A05	"Out-of-service" signal sent to CPU.
FININ	A05	"End-of-read" signal sent to CPU.
LUPOR	A05	"Reader-busy" signal sent to CPU.
LUREN	A05	"Error" signal sent to CPU.
LUCAN	A05	Signal always at high level. - Logic condition invalid.
LENON	A05	"Manual" condition signal sent to CPU.

5.3. GIS 481/ GIS 482 PACK

The GIS 481/482 is the subsystem transcoder in its two envisaged versions. The GIS 481 is for IBM cards and the GIS 482 is for BULL.
The transcoder may function in 3 distinct ways:

1) - Normal mode - In this case a transcoding of card codes is obtained to suit the internal CPU code.
- The GIS 481 does the following transcode: IBM card code to internal GECD code.
- The GIS 482 accomplishes the following transcode:
BULL card code to internal CPU code.
See tables 3 and 4 for the GIS 481 and table 5 and 6 for the GIS 482.

Table 3 - IBM card code and Internal GECD code equivalent

dcba \ hgfe	0000	0001	0010	0011	0100	0101	01110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0000					0	/					11/0	12/0				
0001					1	12/1					11/1	0/1				
0010					2	12/2					11/2	0/2				
0011					3	12/3					11/3	0/3				
0100					4	12/4					11/4	0/4				
0101					5	12/5					11/5	0/5				
0110					6	12/6					11/6	0/6				
0111					7	12/7					11/7	0/7				
1000					8	12/8					11/8	0/8				
1001					9	12/9					11/9	0/9				
1010					8/2	12					11	0/8/2				
1011					8/3	12/8/3					11/8/3	0/8/3				
1100					8/4	12/8/4					11/8/4	0/8/4				
1101					8/5	12/8/5					11/8/5	0/8/5				
1110					8/6	12/8/6					11/8/6	0/8/6				
1111					8/7	12/8/7					11/8/7	0/8/7				

Table 4 - IBM card code and equivalent symbol

	/	1	2	3	4	5	6	7	8	9	8/2	8/3	8/4	8/5	8/6	8/7
0	0	/	S	T	U	V	W	X	Y	Z	←	,	%	=	"	!
/	ƀ	1	2	3	4	5	6	7	8	9	[	#	@	:	>	?
12	&	A	B	C	D	E	F	G	H	I		.	]	(	<	\
11	—	J	K	L	M	N	O	P	Q	R		$	*	)	;	'
12/0	+															
11/0	↑															

Table 5 - BULL card code and Internal processor code equivalent

dcba \ hgfe	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0000		7	8	11												
0001	6	7/6	8/6	11/9						11/6						
0010	5	7/11	8/5	7/5						11/5						
0011	4	7/4	8/4	11/9/7						11/4						
0100	3	7/3	8/3	11/8						11/3						
0101	2	7/2	8/2	11/9/8						11/2						
0110	1	7/1	9/1	11/1												
0111	0	7/0	8/0	11/0												
1000	9	9/7	9/8	12				11/12								
1001	9/6	9/7/6	9/8/6	12/9			11/12/6	11/12/9		12/6						
1010	9/5	9/7/5	9/8/5	12/7			11/12/5	11/12/7		12/5						
1011	9/4	9/7/4	9/8/4	12/9/7			11/12/6			12/4						
1100	9/3	9/7/3	9/8/3	12/8			11/12/3	11/12/8		12/3						
1101	9/2	9/7/2	9/8/2	12/9/8			11/12/2			12/2						
1110	9/1	9/7/1	9/8/1	12/1				11/12/1								
1111	9/0	9/7/0	9/8/0	12/0				11/12/0								

	11	0	1	2	3	4	5	6	12	/
7	A	B	C	D	E	F	G	H	0	7
8	J	K	L	M	N	P	Q	R	I	8
9	S	T	U	V	W	X	Y	Z	'	9
/	.	0	1	2	3	4	5	6	*	ƀ
9/8	,	(	)	—	+	]	?	@	>	=
9/7	\	#	:	←	”	%	&	;	$	/
0	↑								!	
1	[								<	

Table 6 - BULL card code and equivalent symbol

2) - Binary mode - It is obtained by opportunely setting the transcoder circuits to achieve the split of each column in two binary characters each of 6 bits.

Timing is such that, the character relative to perforations 3 to 12, is sent to the CPU first and then that belonging to perforations 9 to 4. The passage from 6 bit binary to 8 bit binary is done with the formula: $b7 = b5$ and $b6 = \overline{b5}$.

Fig. 78 gives the splitting logic and the passage from 6 to 8 bits.

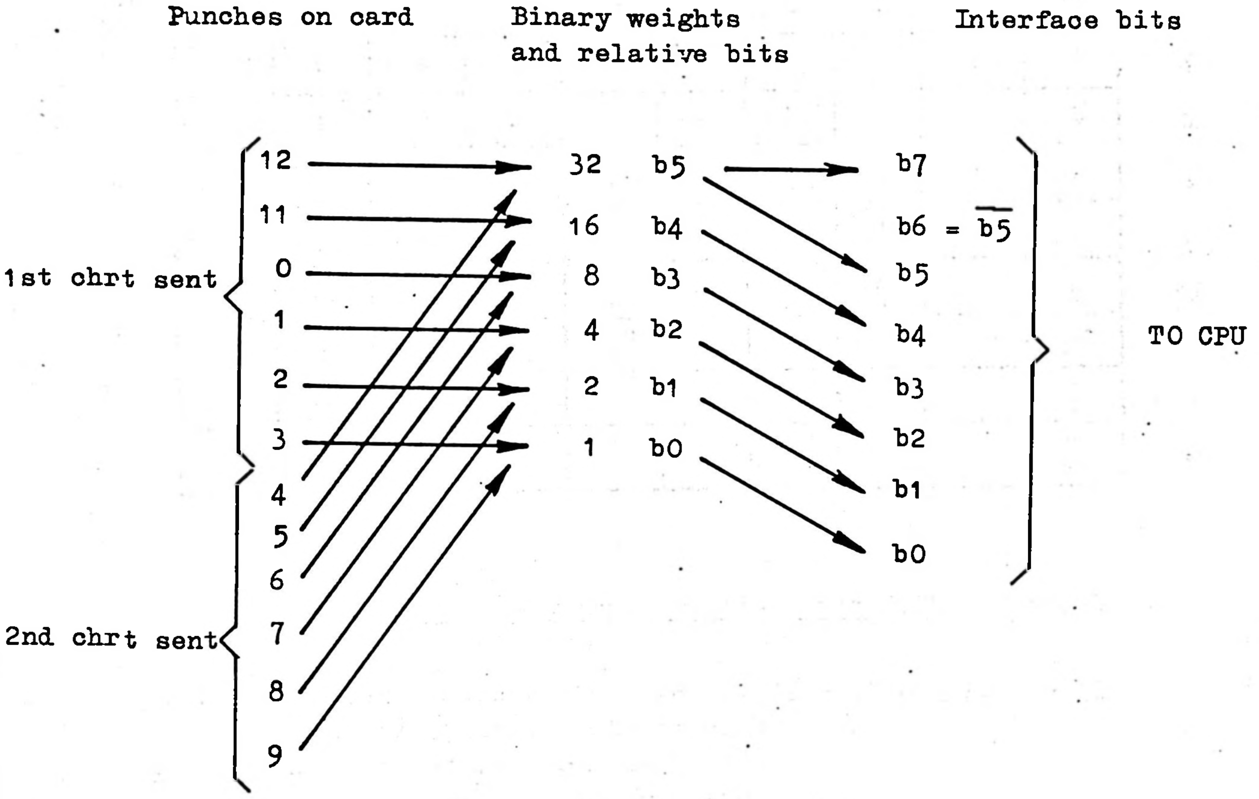


Fig. 78 - Column splitting and binary chrt forwarding

3) - Mixed mode - The reader reads the cards either normally or in binary mode.
It is only read in binary mode if the first column of the card contains perforations 7 and 9 for the GIS 481 and perforations 2 and 6 for the GIS 482.

The GIS 481/2 receives from the controller (GIS 450)the command load signals and the timing signals.
It receives from the D.O.E. (ATA 211) the read signals sending them, after their decode, through the controller to the CPU.

The GIS 481/2 is made with Standar LTR 300 circuitry and occupies one row.
Fig. 79 shows the various signal cable connections between the GIS and the other units.
Reference documentation is reproduced in the "Logic Block Diagrams" chap. 1260 to 1264 for the GIS 481 and chap. 1270 to 1274 for GIS 482.

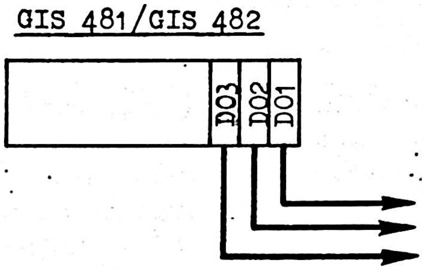


Fig. 79 - GIS 481/2 cable connections

5.3.1. Mixed mode read logic, command load and timings

Read logic for mixed mode reading and the loading of commands with their respective timings may be checked in the "Logic Block Diagrams" chap.1260 for GIS 481 and 1270 for GIS 482.

1) - FF MIMO loads those read conditions given for mixed mode reading. It sets when the command of read or put in mixed mode is sent (COCOB ‾|_ · PCMIN ‾|_|‾) and it resets when the command of read or put in normal mode and binary is sent. (COCOB ‾|_ · RIMIN ‾|_|‾) It is furthermore resetted by the start of work CLEAR signal (RECO 1).

2) - FF BIPA loads the condition of read the card in binary mode.
It sets when the read command is sent or when binary mode is given (COCOB ‾|_ · DEBIN ‾|_|‾).

FF BIPA also sets in the case of mixed mode reading if the first column of the card has perforations 7 and 9 (GIS 481) or perforations 2 and 6 (GIS 482) with signal BIMO.
The FF resets when:

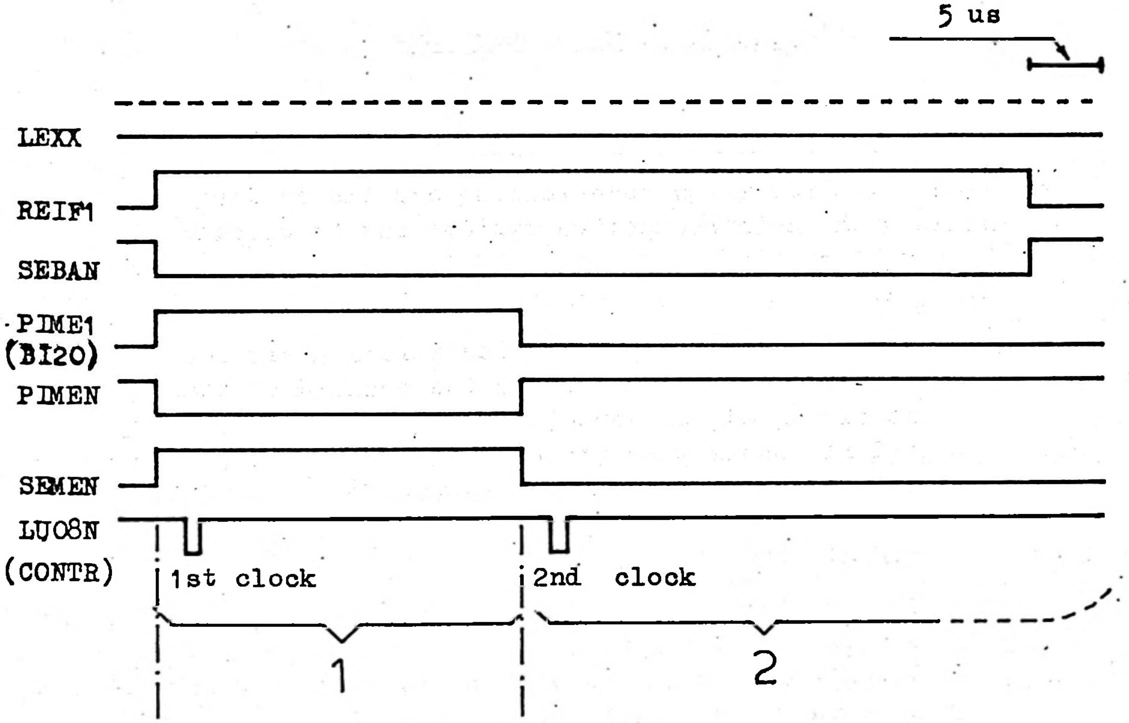
a) - a new read command is sent (COCOB ⌉_ . REBIN ⌉_⌈) or,

b) - put normal or mixed mode (COCOB ⌉_ . REBIN ⌉_⌈) or,

c) - end of mixed mode reading (sig. RIBI) and

d) - start of work clear signal (RECO 1).

3) - One shot PIME 1 triggers, only during binary reading, coincident with every read column strobe.
Its function is to create in the controller with signal BI20 the 2nd character accompany clock. It also helps the formation of signals PIMEN and SEMEN which validate, respectively the first and the second part of the column when read in binary mode.



Note: 1 - Reading of perforations 12 to 3 and 1st character transfer.

2 - Reading of perforations 4 to 9 and 2nd character transfer.

Fig. 80 - Column read timing in binary mode

In the eventuality that a card is read in binary when the transcoder has been set for mixed mode, signal BIMON triggers one-shot PIME 1 during the reading of the first column.

For the following columns the triggering occurs normally through condition SEBAN ¯|_ · BIPAN ¯|_|¯

5.3.2. Binary read logic

For reference see chap. 1261 for the GIS 481 and chap. 1271 for GIS 482.

Signals LUXXN, sent to the CPU, are formed by signals BUXX, BIXX and BAXX, which are examined individually.

a) - Signals BUXX: they come from the transcoder logic, are read signals obtained following the pattern shown in Tables 3 and 4.

b) - Signals BIXX: binary read signals belonging to column perforations 12 to 3. They are validated by signal PIMEN when low and when coincident with the 1st character accompany clock relative to the column.

c) - Signals BAXX: they are the binary read signals belonging to column perforations 4 to 9. They are enabled by signal SEMEN when low and when coincident with the 2nd accompany clock relative to the column.

d) - Signals LU06N and LU07N: they are formed, during binary reading, by signals B007 and B006 to obtain the following combinations:

LU07N (b7) = LU05N (b5)
LU06N (b6) = LU05 ($\overline{b5}$)

5.3.3. Transcode logic

For reference see chap. 1262 for the GIS 481 and chap. 1272 for the GIS 482.

This logic is obtained by a NOR network to realise the transcode condition exposed in tables 3 and 4.

The network input has the LEXX (readings) signals from the ATA 211.
The output is given by signals BUXX which are sent to binary read logic.
Signals BUXX are cut off, during binary read, by signal BIPA1 (high).

INSTALLATION

GENERAL ELECTRIC
GENERAL ELECTRIC INFORMATION SYSTEMS ITALIA

CARD READER SUBSYSTEM

CRZ 105 - 111 - 112 - 120 - 121

Installation

Second edition

A Field Engineering
publication

4.895.0.501.1/A

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1. INTRODUCTION

The purpose of this manual is to furnish a sequence of operations to optimize the installation of a CRZ 105-111-112-120 and 121 subsystem.

The mentioned operations presume that the site has been adequately prepared in accordance with the requirements quoted in the "Site Preparation" manual but do not directly consider the actual configuration of the Card Reader subsystem.
The installation team will draw all necessary informations from two auxiliary documents, individual to each installation :

1 - Site layout
Giving the collocation of the subsystems in the site and showing those accessories which, though not normally supplied with the subsystems, are necessary to overcome particular space or operative problems, such as extra low level cable ducts, cable ways and so on.

2 - Unified Subsystems Connections
The forms bearing the above name, give information upon the connection of the subsystems to :
- the CPU or MPA connectors,
- the centralized DC power supply,
- the AC supply breakers.

The Unified Subsystems Connections (USC) forms also give details on the insertion of plugs and terminators.
A detailed description on how to use the USC forms will be found in the CPU Installation Manual P.N. 4.625.0.000. /A.

All materials necessary for the mechanical and electrical assembly are given in the "Cables and Parts" list of the CRZ 105-111-112-120 and 121 under the voice Kit 1 - Parts Description, Dwg. n° 15023520.

The final subsystem check-out must only be done if the structural and electrical connections have been completed and if the check-out of the Central Processor has been fulfilled.

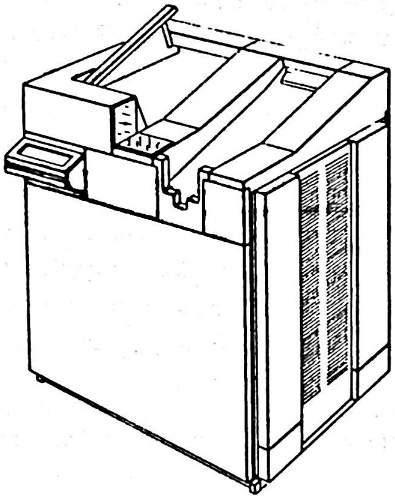


Fig. 1.1. - LS 600 Subsystem (CRZ 105-111-112-120-121)

2. TOOLS AND INSTRUMENTS

The operations to be performed during the installment, may be carried out with the use of the following equipment :

- Engineer's tool kit
- Site tools.

3. ACCEPTANCE AND COLLOCATION

3.1. - PACKING

The subsystem is normally shipped to its destination in a single crate.

External to this packing crate, are affixed two forms giving :
- the contents of the crate,
- the guide to uncrate and remove from the pallet (*).

(*) - Wooden battened transport base.

3.2. - ACCEPTANCE

Upon receipt, all packages are to be visually examined for damage. If any damage is noticed, it will be necessary to :
- have the carrier witness the entity of the damage,
- submit a detailed report to Headquarters.

3.3. - UNCRATING

- Ensure that the subsystem is uncrated as per rules set out by the uncrating guide attached to the outside of the crate.

- Ensure that the contents tally with the description.

- Remove the documents and accessories, contained in the crate, and set them aside.

- Set aside the Parts kit package P.N. 0646048 A.

3.4. - DESKIN AND COLLOCATION

- To ease the removal of the subsystem from the transport pallet and to facilitate positioning and electrical connections, take off all removable panels.

- Position the subsystem as per Site Layout.

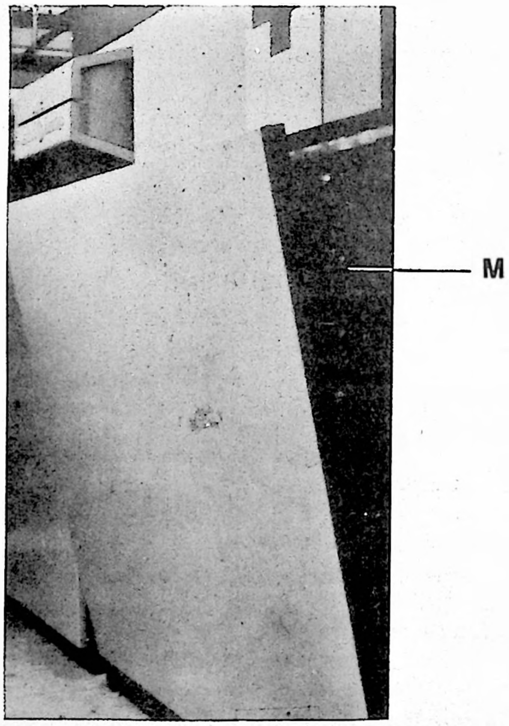


Fig. 3.1. - Front Panel (the pertinent holding magnet "M", is visible after the first removal step)

4. MECHANICAL ASSEMBLY

- Carry out the subsystem mechanical assembly as per Dwg. n° 15043908 using equipment drawn from Kit 0646668 A.
- Set the unit to plumb and perfectly level by adjusting the screw-feet with an Allen Key.

> **Note**
>
> The front right-hand cable duct cover is only to be fitted if the reader is in a terminal position.

5. CABLE CONNECTIONS

- Unfurl the following cables, laying them in the pertinent channels till they reach their connecting point :
  - Signal cables C1, C2 and C3,
  - AC cable C4,
  - DC cables C5 and C6.
- To establish each individual cable connecting point, consult the symbolic markings on the cable itself and refer to the Unified Subsystems Connections (USC) forms.

> Note
>
> **If difficulties arise in the interpretation of the markings or should the cable markings actually be missing, refer to Dwg. n° 15023520.**

- After having taken into account the various cable path bends, take up all exccess cable and fit it in the lowest reader compartment.
- Having connected up the signal cable connectors in sequence B, C and A, clamp them securely along their path.
- Connect up the DC supply cables.
- Insert the AC supply cable, C4, in the pertinent ALI 260 side hole.
- Connect up the breaker, drawn from the Parts Kit.
- Secure the breaker to its mounting position.
- Pull the cable toward the outside and secure it with the bushing clamp using the special pliers as per fig. 5.1.

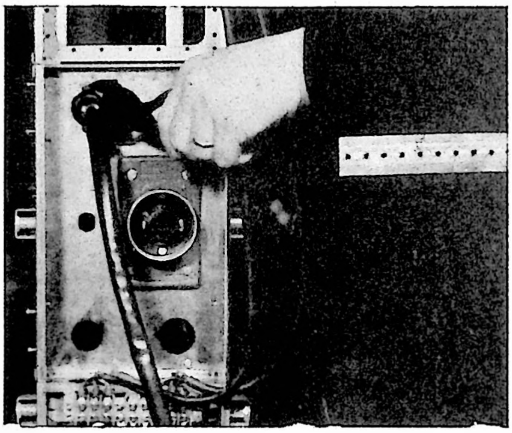


Fig. 5.1. – Use of the Bushing Pliers

6. VISUAL CHECKS

- Expose the mechanics by removing the top covers.
- Remove all transport packing pieces.
- Manually turn the mechanics and check that no undue friction or binds are experienced.
- Manually release the cam clutch and, while still turning the mechanics handwheel, check that the feed clutch releases.
- Relatch both clutches.
- Check that the read head protection glasses are not broken and are properly stuck.
- Check that the read lamp fusion bead is not facing the head.
- Lubricate the stacker helices drive worm gear with STP additive mixed with Type $\boxed{2}$ grease. Using the pertinent dipstick, check the gearbox grease level.
- Visually verify for correct tightness of all nuts and screws, paying particular attention to those of the terminal strips.
- Check for proper insertion of fuses, relays and connectors.

7. CHECK-OUT

7.1. - OFF LINE CHECKS

The below operations are only to be carried out after the mechanical assemblies have been completed and the electrical connections of the entire system have been accomplished.

- Place the subsystem AC supply breakers to ON.
- Switch the system ON and check that the two indicators of the OFF pushbutton are : lower lit and upper off.
  This visualizes the presence of DC and AC power to the subsystem.
- Check that all the fans blow air into the electronics module without abnormal noise.
- Check that the clutches are engaged.
  - Depress pushbutton ON and check that the motor drives the track advance handwheel in the same direction as shown by the arrow stamped on it.
  - If the handwheel turns against the arrow, swap over the phases of the supply cables, to the breaker, in the ALI 260.
- Check that the read lamp is lit.
- Check that the waiting station, sync, track, normal stacker and reject stacker lamps are lit.
- Listen for abnormal noises, sure symptom of loose or binding parts.
- Set the ATA 210 NORM - AUTO switch to AUTO.
- Place an unpunched card in the hopper, press MANUAL FEED and check for proper feed and stacking.
- Place a deck of unpunched cards in the hopper. Feed through and check that they do not suffer damage, otherwise trace and eliminate the fault.
- Set the ATA 210 NORM - AUTO switch to NORM.

7.2. – ON LINE CHECKS

The checks hereby listed are only to be carried out after the final check-out of the Central Processor is completed.

- Ensure that the subsystem diagnostics correspond to the P.N. and description given in the "Product Composition Sheet".
- Feed through all pertinent diagnostics, adhering to the rules given in each diagnostic description.
- If a particular diagnostic program gives rise to an error halt, before starting troubleshooting operations, follow this procedure :
  - check for correct punching of the Site Composition Card, by referring to the Diagnostic Organization Manual,
  - check for correct sequence of the card deck.

If none of these checks give rise to doubt on the accuracy of the diagnostic, proceed to troubleshooting the fault.

8. FINAL OPERATIONS

8.1. - SKIN UP

- Replace all panels and covers removed prior to starting the installation.
- Strip off the yellow protective film from all stainless steel surfaces.

8.2. - CHECKS AFTER DELIVERY TO CUSTOMER

- Check that the drawings and their updating indices, shown in the subsystem folder, correspond to those given in the Product Composition Sheet.
- Transcribe the relevant indices on the FCO Status Log.
- Check that the machine type and serial number, on the yellow label, correspond to the description given in the Product Composition Sheet.
- Check that the supplied tools and equipment physically correspond to the packing list or ISL recommended by the Headquarters.
- Prepare a Report giving details of snags or defects found during the installation.

9. WITHDRAWAL

When a subsystem is withdrawn from a site, it must be removed complete of all the kits mentioned on Dwg. n° 15023520, remembering that all those cables and parts that on the drawing are marked with a cross, are to be left fitted on the subsystem.
Particular attention must be paid to the withdrawal of cable kit 0646667 M and parts kit 0646668 A.

9.1. - OPERATIONS

- Remove power from the system.
- Remove both front and rear subsystem panels.
- Disconnect the AC supply cables and remove the ALI 260 breaker.
- Disconnect the two DC supply cables from the CPU end.
- Disconnect the C1, C2, C3 signal cables from the CPU end.
- Referring to Dwg. n° 15043908, remove the cabinet connecting metal plate and, if necessary, the front right-hand cable duct cover.
- Withold all the cables and neatly fit them in the lowest reader compartment, tying them to the axle guides using string or adhesive tape.
- Referring to Dwg. n° 15023520 recompose all the kits, marking them with their pertinent codes.
- Replace the subsystem panels and covers.

9.2. - SUBSYSTEM REMOVAL

The subsystem must be complete of the following :
- Parts Kit P.N. 0646668 A
- Machine documentation
- Product Composition card
- Diagnostic decks
- Not yet implemented FCOs
- Subsystem tools.

10. ATTACHED DRAWINGS

To complete the present Installation Manual, the following drawings have been attached :

NAME	DRAWING N°	SHEET
Cables and parts list for physical unit connection	15023520.0	
Physical unit connection	15043908.0	1
Physical unit connection	15043908.0	2

	RIF REF	TIPO TYPE	MARCATURA CAVI / CABLE LABELLING: LATO INT. ALL' U.F. SIDE INT. TO PH. UNIT	LATO EST. ALL' U.F. SIDE EXT. TO PH. UNIT	FUNZ. FUNCT.	NOTE NOTES
☒	C1	NS45	GIS450 A03	L-CRZ-A	LOG.	
☒	C2	NS45	GIS450 A04	L-CRZ-B	LOG.	
☒	C3	NS45	GIS450 A05	L-CRZ-C	LOG.	
☒	C4	AL117	ALI290 J1	T-CRZ-Gr	A.C.	1
				Gr		2
				X		3
				Y		4
				Z		5
☒	C5	AL100	ALI210 P3-1/2	U-CRZ- +20	D.C.	6
☒	C6	AL101	ALI210 P3-4/5	U-CRZ-MASSA	D.C.	3

RIF REF	KIT 1 COD 0646667 M: CODICE CODE	Q	KIT 2 COD.: CODICE CODE	Q
C1	0641231L	3		
C2				
C3				
C4	0640488A	1		
C5	0640400F	1		
C6	0640405H	1		

	DESCRIZIONE PARTI PARTS DESCRIPTION	KIT 1 COD 0646668 A: CODICE CODE	Q	KIT 2 COD: CODICE CODE	Q	NOTE NOTES
	BREAKER TQL32010	0002114E	1			7
☒	COPERTURA CANALE CAVI	0677950Y	2			
	COPERTURA CANALE CAVI	0677950Y	1			
☒	VITE T.C. M4x8	6311242W	4			
	VITE T.C. M4x8	6311242W	2			
☒	VITE AUTOFILETTANTE Ø 4,2x9,5	0005343D	2			
	VITE AUTOFILETTANTE Ø 4,2x9,5	0005343D	1			
	LAMIERA COLLEGAMENTO MOBILI	0836434W	1			

NOTE:
NOTES
1) Colore verde (Green)
2) Colore Marrone (Brown)
3) Colore nero (Black)
4) Colore rosso (Red)
5) Colore Blu (Blue)
6) Colore giallo (Yellow)
7) Ved.dis. (See dwg) N° 15043 908

X) Parti montate alla spedizione – Parts assembled when delivered.

REV			
0	68173	18.6.68	

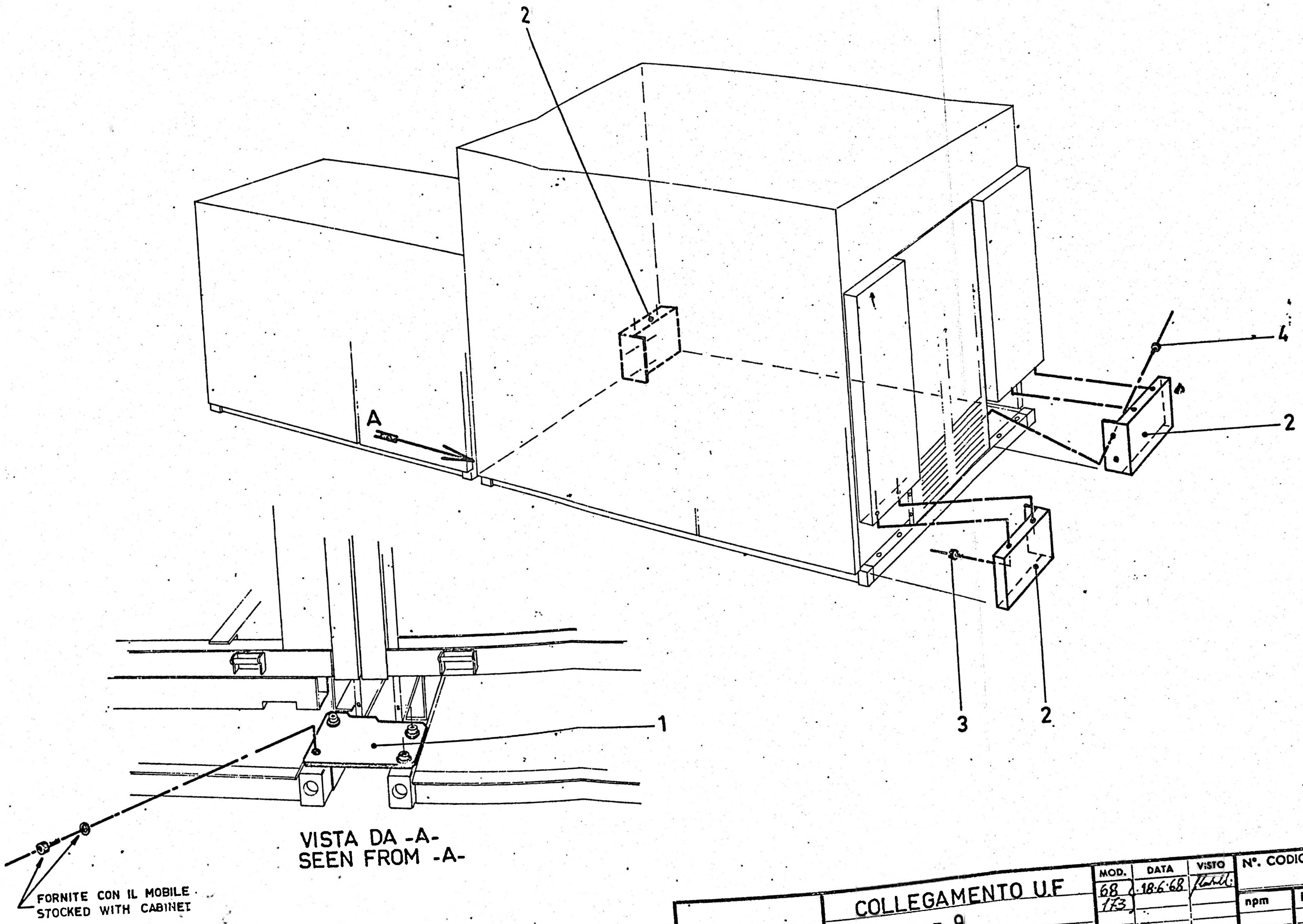
comp. Sembolon
emiss.
appr.

LISTA CAVI E PARTI PER IL COLLEGAMENTO DI UNITA' FISICHE
CABLES AND PARTS LIST FOR PHYSICAL UNIT CONNECTION
LS 600 - CRZ 120
appl.

GENERAL ELECTRIC

sez.-sec. S.P.S.
loc. Pregnana M.

N° 15023520 0
cont. su fo. /   fo 1



VISTA DA -A-
SEEN FROM -A-

SU FOGLIO 2 SEGUE
TABELLA MATERIALI

PARTS LIST FOLLOWS
ON SHEET 2

GENERAL ELECTRIC		COLLEGAMENTO U.F PARTICOLARE 9 PHYSICAL UNIT CONNECTION DETAIL No 9	MOD.	DATA	VISTO	N°. CODICE
Scala —	Firma UGGERI		68 173	18·6·68		npm
ST						DISEGNO
MAT. —		TT —	FIN. —			N°. DISEGNO 150 43 908
						Fo. 1(2) o

cod. 3896103 T

FIRMA *SIGN*	IND. ORIG	GRUPPO-*GROUP* 01 02 03 04 05 06	ORD.APPL.	REV.	DATA
Alun				0	18·6·68

COD. ARG	ATT UL	ATT UL	ATT UL	ATT UL	ATT UL	ATT UL

COD. 1 2 3 4 5 6 7 — SIGLA-NAME

QUANTIT. Col.80 .3=Nuova ut. 8=Variaz quant. 4=12=utiliz. sop

RIF. ITEM	NºDIS.-*DRAW.No*	NºCOD.	DESCR.	01	02	03	04	05	06	UM	TD
1		0836434W	LAMIERA. COLLEGAMENTO MOBILI	/							
2		0677950Y	COPERTURA. CANALE CAVI	/							
3		5311242W	VITE T.C. M4×8	/							
4		0005343D	VITE AUTOFILETTANTE ⌀4,2×9,5	/							

TIT. COLLEGAMENTO U.F. PARTICOLARE 9
PHYSICAL UNIT CONNECTION DETAIL No 9

COMP. UGGERI
APPROV.

GENERAL ELECTRIC

STAND.	TP	FOR.	Nº
			150 43 908 o CONT. SU FO. — FO. 2

Cec. 39°c033 2

MAINTENANCE

GENERAL ELECTRIC

LS 400 - LS 600 - CRD 160

SUBSYSTEM

Maintenance

MAY 1968

Promulgated by order
of the Product Service

4.896.4.001.0/A

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98	107.0		03/70											
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100	109.0													

Mod. 0142_1

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101	4.896.4.110.0													
102	111.0													
103	112.0													
104	113.0		03/70											
105	114.0	09/69												
107	115.0													
108	116.0	09/69	03/70											
109	117.0													
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Mod. 0142_1

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140	148.0		03/70											
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Mod. 0142_1

1. OPERATOR TASKS

ROUTINE : **1.1**

NAME : General cleaning
DURATION : 0.25 hr
PREREQUISITES : None

1 – TOOLS AND MATERIALS

– Soft brush	P.N.	7138903 H
– Cloth	"	3315125 K
– Cotton wool	"	3313100 A
– Alcohol	"	3192250 D
– Solvent Meticellosolve	"	4355416 V

2 – PURPOSE

- To ensure perfect cleanliness of the hopper, track, stackers and lamps.

3 – PRELIMINARY CHECKS

- The frequency at which these checks are to be carried out, is at least weekly with an average work load of 600.000 to 800.000 cards.
  The machine must be switched off at least 5 minutes beforehand.

4 – PROCEDURE

1 – Vacuum and / or brush clean the hopper, waiting station, track and both stackers. Eventually pass the cloth over the hopper and stacker surfaces a second time.

2 – Using a cloth and/or dry soft brush, remove the card dust from the waiting station and track photocells, paying attention not to alter their position.

3 – Using alcohol dampened cotton wool, clean the main lamp, avoiding to finger it.
Open the head lens group and clean the closure glass panes.
Do not use abrasive tools, and avoid depositing any lint traces on the surfaces. See fig. 1.1.

4 – Open the waiting station and using meticellosolve dampened cotton wool, clean the feed belts and read head input and output counter-rollers.
Leave sufficient time for parts to dry before closing the station.

5 - Upon completion of the cleaning operations, and particularly when the metilcellosolve solvent has been used, allow a few minutes drying time.

5 - FINAL CHECKS

- Feed through some unpunched cards so as to free the machine from any dust or meticellosolve residues.

ROUTINE 1.2

NAME : Read lamp replacement
DURATION : 0.20 hr
PREREQUISITES : None

1 - TOOLS AND MATERIALS

- Read lamp	P.N. 001749 E.

2 - PURPOSE

- To change the read lamp.

3 - PRELIMINARY CHECKS

- Switch the machine off and wait at least 5 minutes before removing the defective lamp.

4 - PROCEDURE

1 - Take out the lamp grasping it from the center and pushing it downwards to release it from its contacts.

2 - Replace the new lamp in the reverse order of removal. Ensure that the fusion bead is facing away from the read head.

3 - Thoroughly clean the bulb with cotton whool and alcohol. Leave to dry before attempting to switch on. See fig. 1.1.

5 - FINAL CHECKS

- Switch the machine on and check for good head illumination.

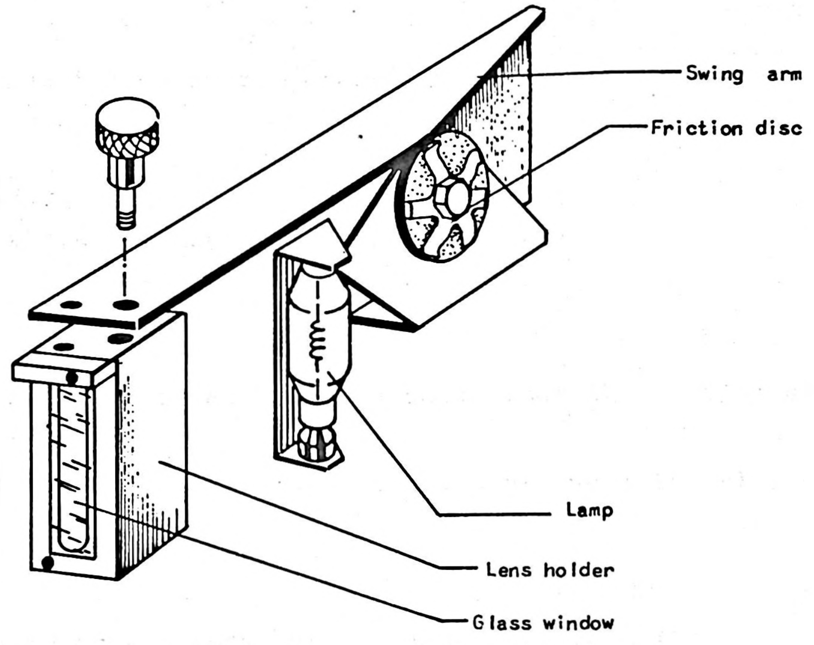

Fig. 1.1. – Lens – lamp group

ROUTINE : **1.3**

NAME : Jamming card removal
DURATION : 0.15 hr
PREREQUISITES : None.

1 - TOOLS AND MATERIALS

- None.

2 - PURPOSE

- To restore the machine to normal operational conditions.

3 - PRELIMINARY CHECKS

- Find the place where the jamming card is lying.

4 - PROCEDURE

1 - If the card is before or at the read head, open the waiting station and remove it.

2 - If the card is along the track, rotate the handweel to release it.

5 - FINAL CHECKS

- Switch the machine on and feed through some card manually.

2. MAINTENANCE CHECKS

ROUTINE 2.1

NAME : Feed hopper
DURATION : 0.25 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- It is indispensable to have a good card feed cycle especially when only a few cards are left in the hopper and to prevent false feeds caused by worn or badly adjusted belts.
  The stacking of the card deck in the hopper is of fundamental importance to ensure a faultless card feed.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - FEED BACKUP PLATE

1 - Check that the feed backup plate remains up and secure when so positioned. Adjust, if necessary, the spring blade position.

2 - Ensure that when the backup plate is released, it slides freely, aided only by gravity, onto the feed belts.

3 - Cut two 30 mm wide strips from a card, fit these between the feed belts and the backup plate.

4 - Remove them simultaneously comparing the pull necessary to extract each.
If the pull is unbalanced see Routine 4.14. for backup plate adjustment.

4.2. – MICROSWITCH

1 – Ensure that without cards in the hopper and the feed backup plate contacting the belts, the hopper msw is released and does not touch the backup plate.
If this requirement is not met, adjust the vertical positioning of the backup plate as per Routine 4.14.

2 – Load some cards and check for correct microswitch operation with and without cards. See Routine 4.23.

4.3. – FEED BELTS

1 – Manually release the cam clutch and rotate the handwheel.

2 – Check that any tolerable wear is evenly distributed along the whole length of the belts.
If the belts appear irregularly worn, change them as per Preventive Maintenance Schedules by slackening screws Z and following Routine 5.11.

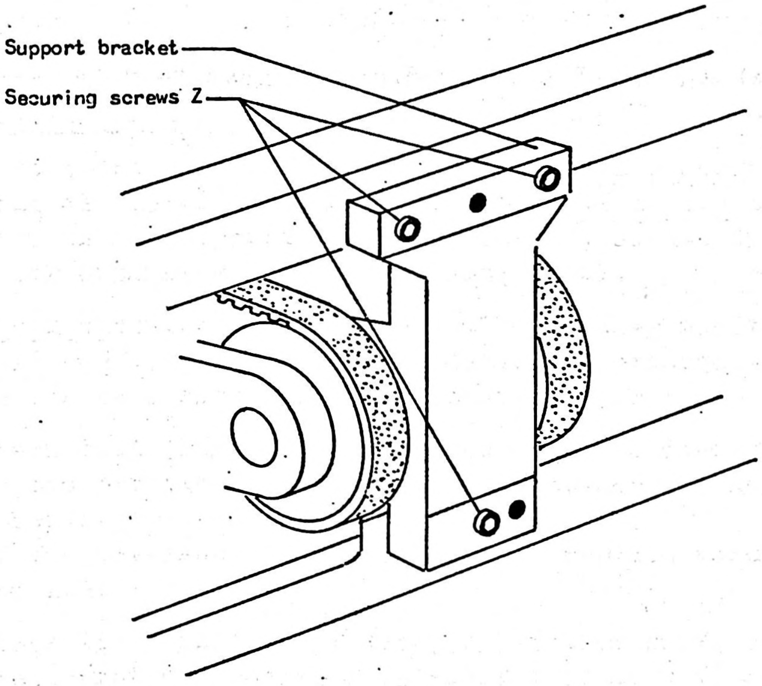

Fig. 2.1. – Feed belts block

3 - Remove the feed belt block and check that the tension is equal for both belts.
Check this by endevouring to rotate two pulleys belonging to one belt in opposite directions. The angular movement should be minimum or nil. Refer to Routine 4.3.

4.4. - SWINGING PLATTEN

1 - Manually release the cam clutch. Rotate the camshaft to cause index P on the feed cam, to coincide with the axis of the corresponding roller.

2 - At this position check, with a steel rule, that the feed belts and the swinging platten are on the same plane. Refer to Routine 4.4.

4.5. - THROAT

1 - Check that the upper edge of the throat is not worn. If any wear is visible, change it.

2 - Check the throat parallelism and gap to be 0.2 to 0.25 mm
Refer to Routine 4.8.

5 - FINAL CHECKS

- Feed through about a hundred cards and ensure that feed is smooth and trouble-free.

ROUTINE : **2.2**

NAME : Cam clutch, levers and relative gears
DURATION : 0.30 hr.
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To check the condition of the gear trains and cam clutch to obviate faulty operation and put right misadjustments.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Check that the clearance of operation of the stop pawl is between 0.2 and 0.3 mm . See Routine 4.1.

2 - Rotate the cam shaft 1/2 a revolution and check that with the solenoid de-energized, the pawls are 0.2 to 0.3 mm from their cams. If this requirement is not satisfied, adjust the position of the shock absorbing lever. See Routine 4.2.

3 - Check that the play of the pawls on their shaft does not exceed 0.3 mm . If this specification is exceeded, replace the pawls or the pawl carrying shock absorbing lever.

4 - Check that play on the stop pawl tie rod does not exceed 0.5 mm on its pivoting points (stop pawl on one end and armature on the other).
If the tolerance is not satisfied, replace worn items. See figs.2.2. and 2.3.

5 - Check the condition of the pinch roller surfaces. Ensure that the counterrollers rotate freely. If they do not, change them.

6 - Check out the condition of the ball clutch as per Routine 4.24..
(See fig. 2.4., 2.5. and 2.6.).

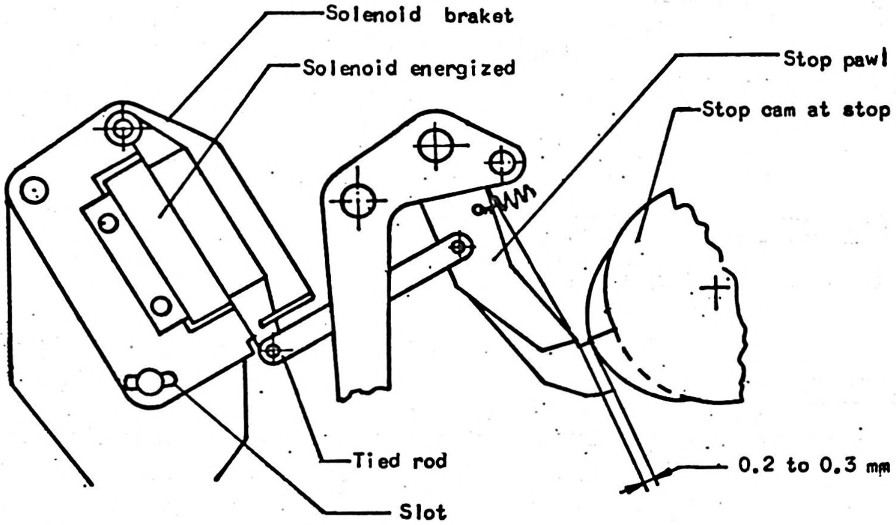

Fig. 2.2. - Cam clutch energized

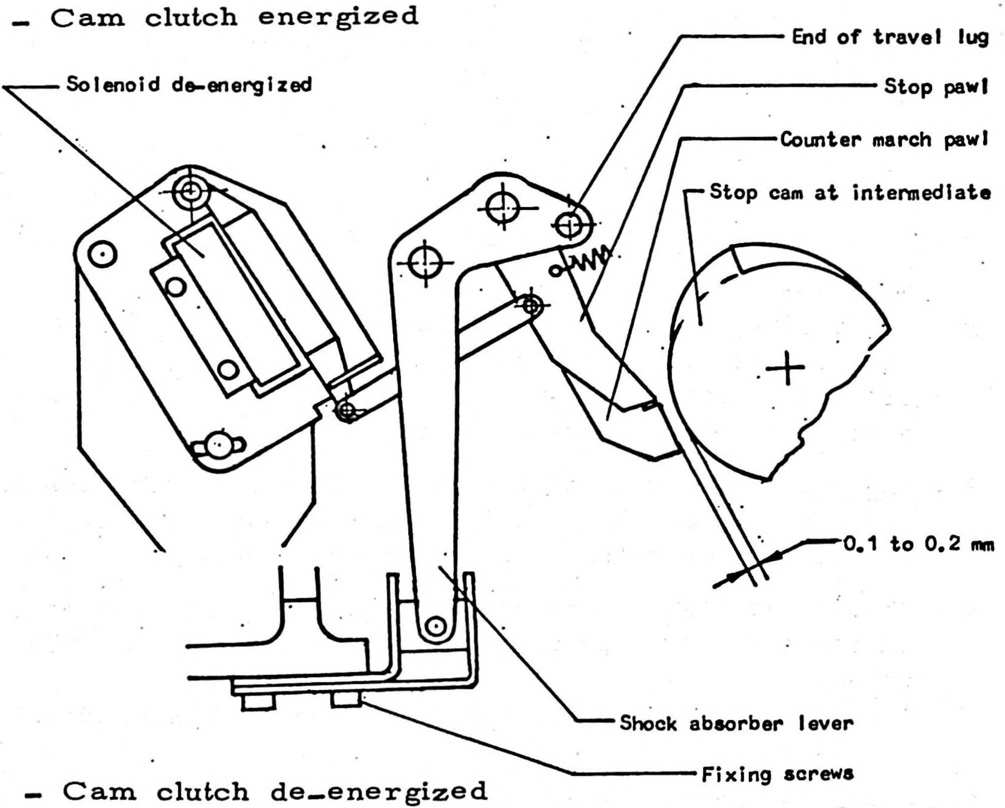

Fig. 2.3. - Cam clutch de-energized

5 - FINAL CHECKS

- None.

ROUTINE : 2.3
NAME : Feed clutch
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Engineer's tool kit.

2 - PURPOSE

- To ensure that the clutch settings permit correct card feeding.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Manually release the cam clutch. Rotate the handwheel and ensure that the feed clutch disengages with a clearance of $\boxed{0.2\ \text{mm}}$. See Routine 4.5.

2 - Rotate the handwheel very slowly and observe that, as the camshaft turns a few times, the cam follower follows the cam profile. If this requirement is not met, change the feed command lever return spring.

5 - FINAL CHECKS

- None.

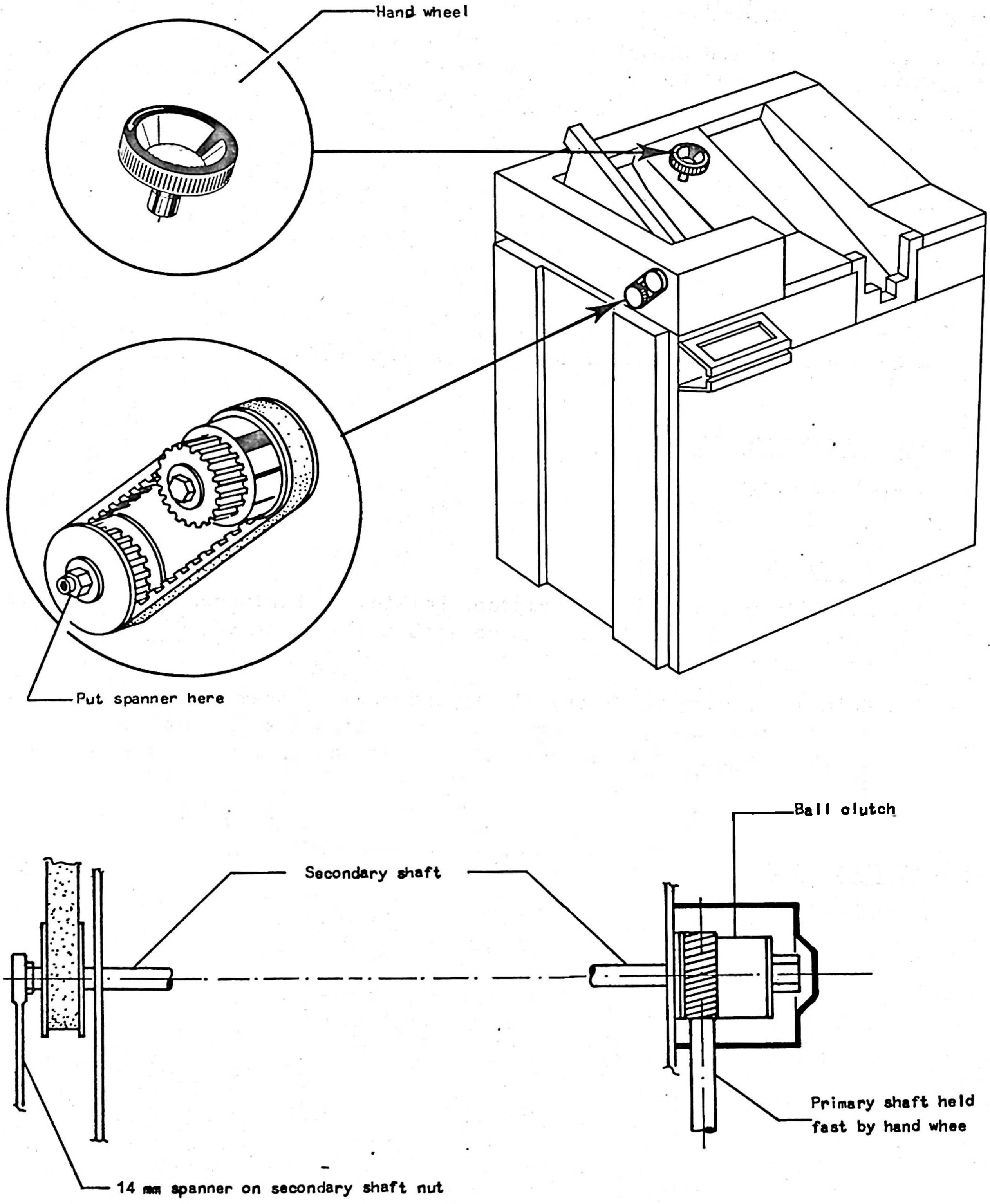
Hand wheel
Put spanner here
Ball clutch
Secondary shaft
Primary shaft held fast by hand whee
14 mm spanner on secondary shaft nut

Fig. 2.4. - 2.5. - 2.6. - Ball clutch driving secondary shaft

ROUTINE : **2.4**

NAME : Waiting station.
DURATION : 0.30 hr
PREREQUISITES : None .

1 - TOOLS AND INSTRUMENTS

- Spanner special, eject roller adjust	P.N. 0688798 L
- Gauge GO-NO-GO	" 0688773 L

2 - PURPOSE

- To check the condition of wear of the various rollers to ensure correct card feed towards the read head.

3 - PRELIMINARY CHECKS

- None.

4 - PROCEDURE

1 - With the cam clutch engaged, check the eject roller adjustment using the GO-NO-GO gauge P.N. 0688773 L.
If any adjustment is required, use special spanner, P.N. 0688798 L following Routine 4.10.
Furthermore check wear on the roller. The hight of tread must not be less than $\boxed{0.3\ \text{mm}}$. If this is exceeded change the roller.
See fig. 2.7.

2 - Manually release the cam clutch. Rotate the handwheel until the alignment roller reaches max withdrawal beyond the waiting station bottom plate. Check then with GO-NO-GO gauge the roller adjustment.
See Routine 4.9.
Engage the clutches. See fig. 2.8.

3 - Check that the alignment and waiting station eject idle rollers rotate freely.

4 - Check that the read station downstream and upstream idle rollers rotate freely. Check for wear. Change them if necessary.

5 – Close the waiting station and check that the roller of the waiting station msw actuating lever may be depressed further by 1 mm See Routine 4.21. .

6 – Replace lamp FOCA as per Maintenance Log.

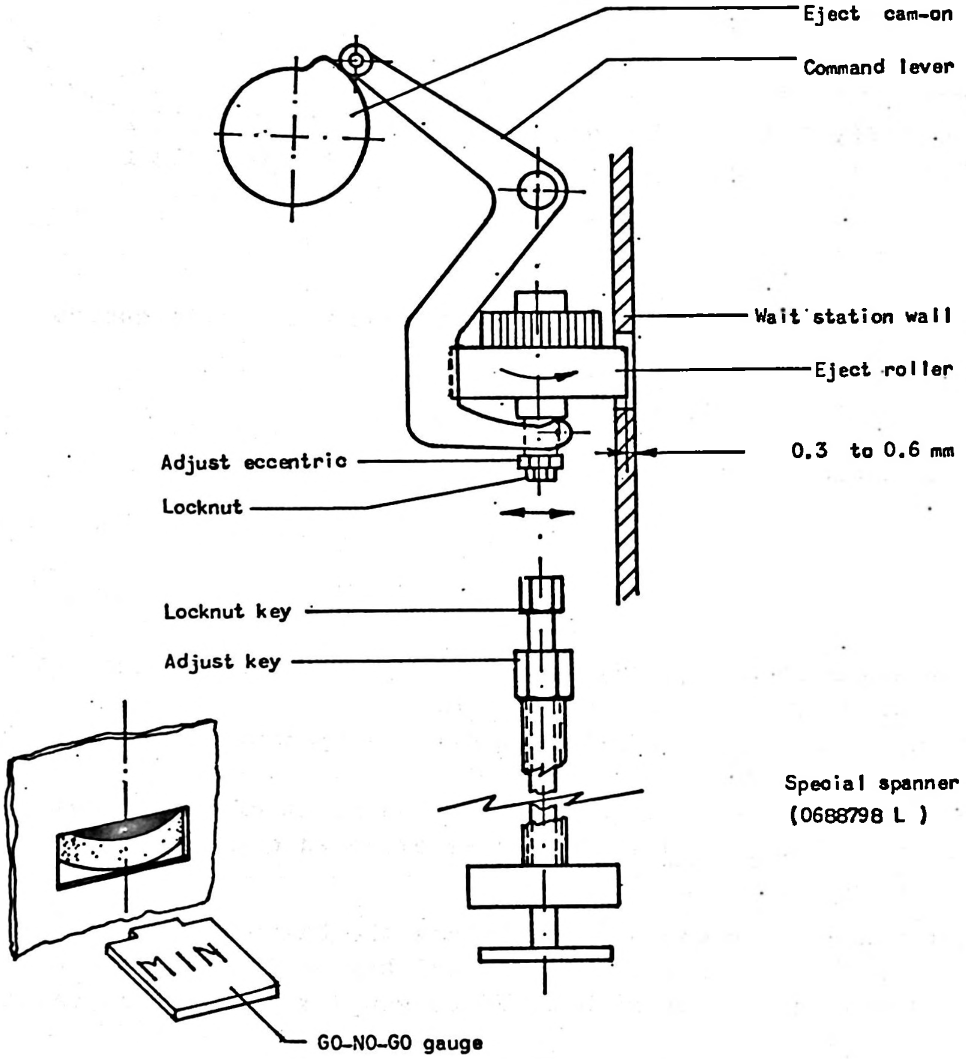

Fig. 2.7. – Eject roller

5 – FINAL CHECKS

– None.

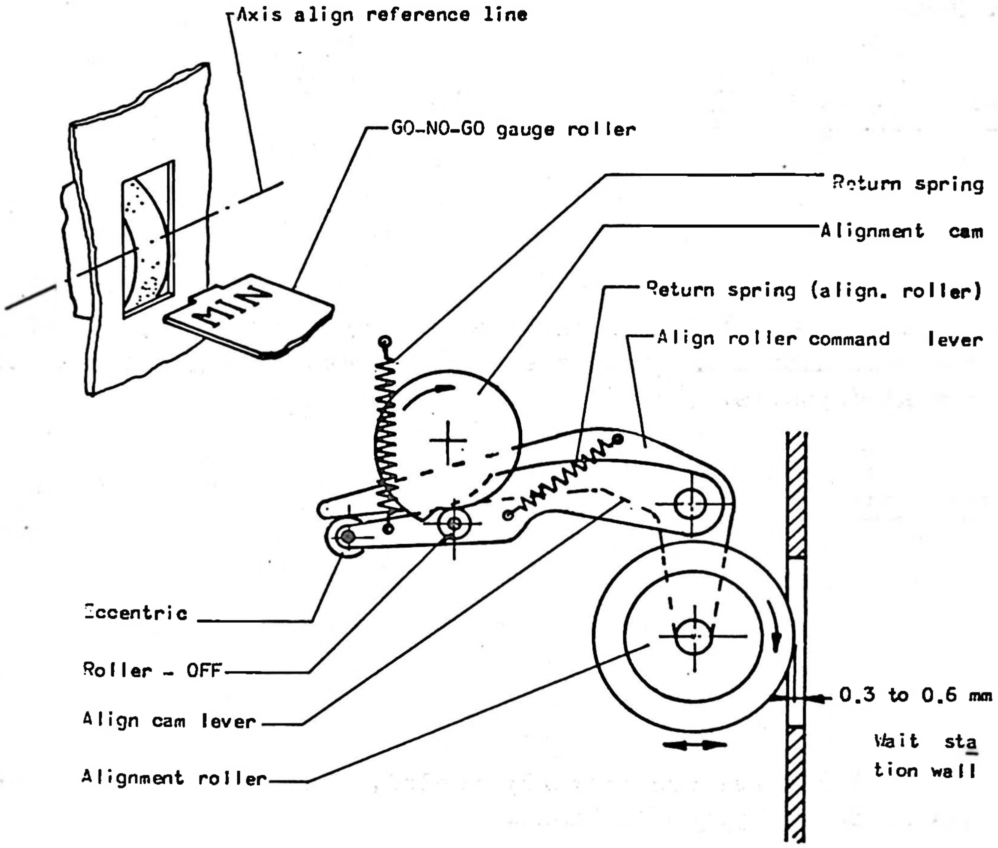

Fig. 2.8. – Alignment roller

ROUTINE : **2.5**

NAME : Read head and sync photodisc
DURATION : 0.30 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- None

2 - PURPOSE

- To allows a correct operation of the read and sync circuits, therefore forestalling malfunctionings caused either by read head glass deterioration and dust deposits.

3 - PRELIMINARY CHECKS

- None

4 - PROCEDURE

4.1. - READ HEAD

1 - Check that all glasses are properly bonded, that they present no scratches or zones opaque to light.

2 - Ensure that the read lamp presents the quartz-line fusione bead on the opposite side to the read head. See Routine 4.27.

3 - Replace the read lamp as per Maintenance Log.
See Routine 1.2.

4 - Check that the damping on the lens housing arm, allows freedon of movement, without compromising the safety of the assembly.
See Routine 4.17.

5 - FINAL CHECKS

- None .

ROUTINE : **2.6**

NAME : Card track
DURATION : 0.15 hr
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

– Spring pressure gauge	P.N. 0688796 T

2 – PURPOSE

– To check the adjustments so that the card is transported without being submitted to damage or undue wear.

3 – PRELIMINARY CHECKS

– Machine off.

4 – PROCEDURE

1 – Check that the pressure exerted by the roller idlers on the card respects the procedure described in Routine 4.26 using special tool P.N. 0688796 T.

2 – Operate manually the mechanical deflector. Check that the point has shifted $\boxed{\text{0.3 to 0.6 mm}}$ from the rails.
Releasing the deflector the point must be $\boxed{\text{0.3 to 0.6 mm}}$ on the other side of the rails. See Routine 4.13.

3 – Check for tightness of all the optic groups thumb-screws.
Replace lamps as per Maintenance Log.

5 – FINAL CHECKS

– None.

ROUTINE : **2.7**

NAME : Stackers
DURATION : 0.20
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Dynamometer 0-1 Kg P.N. 4355415 R

2 - PURPOSE

- To allow card stacking without damaging or curling them.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Ensure that the stacker input pawls have their reference marks vertically aligned with the stacker input card guide profile.If to the contrary, adjust them by acting on the eccentrics. Routine 4.15. The pawls must move with freedom and return under spring tension.

2 - Visually check the rubber card bounce pads. They must be serviceable. If they show signs of wear, replace them.

3 - Ensure that the card backup plates slide freely throughout their travel.

4 - The spring tension must be:

- 200 to 300 gr - Both stacker when empty,
- 300 to 400 gr - Reject stacker when full,
- 800 to 900 gr - Normal stacker when full.

With the stacker empty and the backup plates at end of travel, heck that the backup plate is $\boxed{\text{5 to 7 mm}}$ from the stacker helix. This distance is to be measured from the input side of the stacker.
If the requirement is not met, slacken the fixing screws as per Routine 4.16, and move the backup plate to be within tolerances.Tighten then the screws.

5 - Check the stacker full msws. They must trip at approx $\boxed{\text{8 mm}}$ before the backup plates reach the end of their travel. Adjust if necessary the msw actuating lever to obtain the required safety of operation.

6 - Put the backup plate in the stacker full condition and check that by pushing the msw actuating lever, a clearance of $\boxed{\text{1 mm}}$ is present between the msw actuating lever roller and the surface of the adjustable bracket. See Routine 4.22.

7 - Check the state of wear of the worm-helical gear coupling. If worn, change the assembly as per Routine 5.21.

5 - FINAL CHECKS

- Feed through about 500 cards and check for orderly stacking.

ROUTINE : **2.8**

NAME : Toothed drive belts
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To ensure that the transmission of drive given by the toothed belts is smooth and correct, thus insuring maximum life.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Check the tautness of all belts. The tollerable give is determined by attempting to rotate the driven pulleys by the belt. See Routine 4.18.
To increase or decrease belt give, alter the idler position.
Belts must never be over-taut. This will cause premature wear.

2 - To vary the tension of the primary drive belt, the motor must be shifted in its slotted screw holes. At adjustment end, tighten the fixing bolts.

3 - The eject roller drive belt tension is adjusted by slackening the 6 screws that secure the feed block (from the underside) to the machine base.
Position accordingly the motor drive belt, the belt between the first and second flange and the sync disc.
Take up any play on the belt by shifting the position of the feed block.

4 - Tighten the feed block fixing screws. Check the adjustment of items that have been interfered with.

5 - FINAL CHECKS

- None.

ROUTINE : 2.9

NAME : Dynamic checks
DURATION : 0.20 hr
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

- None.

2 – PURPOSE

- To discover any eventual malfunctioning when the machine is under power.

3 – PRELIMINARY CHECKS

- Remove access panels from the machine.

4 – PROCEDURE

1 – Switch the machine on by pulling upwards the panel microswitches.

2 – Check that all the electronic models fans operate correctly.

3 – Put the maintenance console ON LINE / OFF LINE switch to OFF LINE.

4 – Feed through the machine some unpunched cards to remove any traces of dust or lubricant.Check that the cards are not damaged or curled.

5 – Listen for unusual noises or vibrations.

5 – FINAL CHECKS

- None.

ROUTINE : 2.10

NAME : Electronic checks
DURATION : 0.50 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Voltmeter
- Scope
- Bridge links P.N. 0800761 V

2 - PURPOSE

- To establish correct read circuit operation and to check that all fundamental parameters have well defined values.

3 - PRELIMINARY CHECKS

- A deck of punched cards in the hopper.

4 - PROCEDURE

1 - Put the maintenance console ON LINE / OFF LINE switch to OFF LINE.

2 - Check read lamp power supply for $\boxed{\text{13.2 VDC}}$. See Routine 4.30.

3 - Check that the beam from the light pipes is centered on the photodiode. See Routine 4.20. and 4.28.

4 - Check sync photodiode signal FODI: See Routine 4.33.

5 - Feed cards punched on all rows and jig checked.
Set ALXX read signals to 350 usecs. See Routine 4.34.

6 - Check start of cards one-shot RIPE. See Routine 4.37.
Still proceeding with the auto-sync disabled, feed through some punched cards checking that no sync errors are given.
Vary one-shot RIPE ± 50 usec. No error should still occur. If an error is encountered, proceed as follows:
a - Adjust the waiting station fastening device. See Routine 4.11.
b - Adjust the interested belt tensioning idlers. See Routine 4.18.
c - Change, if necessary, the springs of the upstream or downstream idlers.

7 - Vary the lamp supply from 12.3 to 14.1 VDC. Feed through some unpunched cards and check for no error.
If error is still had, check the card read circuits and rectify any fault.
Set the lamp supply back to 13.2 VDC.

8 - Adjust the threshold of the AFOT signals for the waiting station, the track and both stackers, in the following way:
a - Turn the pot until the photodiode gives low signal.
b - Turn the pot now CW 4 full revolutions. Routine 4.32.

9 - Check out the timing of all machine one-shots. Routine 4.35.

10 - Put the maintenance console ON LINE / OFF LINE switch to ON LINE.

5 - FINAL CHECKS

- Feed through diagnostics checking for correct machine operation.

3. CLEANING AND LUBRICATION

ROUTINE 3.1

NAME : Cleaning
DURATION : 0.35 hr
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

– Brush	P.N. 7138903 H
– Cloth Common	" 3315125 K
– Cotton wool	" 3313100 A
– Alcohol	" 3192250 D
– Solvent Metilcellosolve	" 4355416 V

2 – PURPOSE

– To ensure perfect cleanliness of the subsystem organs to obviate faulty operation due to dust or dirt deposits.

3 – PRELIMINARY CHECKS

– Machine off.

4 – PROCEDURE

4.1. – GENERAL CLEANING

- Clean with compressed air or brush and cloth the:
  - Supporting frame, base and castings,
  - Machine internally (framework, Power Supply, cables and strips),
  - Dividing bulkhead between electronics and mechanics.

4.2. – CARD HOPPER

1 – Clean, with compressed air or brush and cloth, the hopper base plate, the swinging platten, the throat and the feed belts.

2 – Clean, with cotton whool soaked with Metilcellosolve, the feed belts along their whole length. Dry accurately.

3 – Clean, with cotton wool soaked with alcohol, the backup plate guides.

4.3. - CAM CLUTCH GEARS

1 - Remove the oil and lubricant paste from the cam clutch gears.

4.4. - PINCH ROLLERS AND COUNTERROLLERS

1 - Clean, with cotton whool soaked with Metilcellosolve, the surfaces of the pinch rollers and counterrollers.

4.5. - WAITING STATION

1 - Clean, with compressed air or brush and cloth, the waiting station wall, the swinging wall, the rollers and counterrollers.

2 - Clean, with cotton whool soaked with Metilcellosolve, the eject and alignment rollers with their relative counterrollers. This is to remove all traces left by the cards.

3 - Clean, with cotton wool moistened with alcohol, the wait station photocell block light pipe end surface. Clean from the wait station internal side.

4.6. - READ HEAD

1 - Clean, with compressed air or brush and cloth, the lens - photocell group.

2 - Clean, with cotton wool soaked with alcohol, the lens glass panes , the photocell container glass and the actual read lamp.

4.7. - CARD TRACK

1 - Clean, with compressed air or brush and cloth, all rollers, counterrollers and the mechanical deflector.

2 - Clean, with cotton wool soaked with Meticellosolve, the track rollers and their counterrollers.

3 - Clean, cith cotton wool soaked with alcohol, the track photocell container and light pipes end surface.

4.8. - STACKERS

1 - Clean, with compressed air or brush and cloth, the bottom plate and stacker helices.

5 - FINAL CHECKS

- Carry out an OFF LINE check. For CRD 160, see Installation Manual para. 7.2.

ROUTINE : **3.2**

NAME : Lubrication
DURATION : 2 hr
PREREQUISITES : Routine 3.1.

1 - TOOLS AND MATERIALS

- Oil type	③	SAE 50	P.N.	0491020 G
- Oil type	①	Vaseline	"	0491021 H
- Grease type	$\boxed{2}$	GL1	"	0491017 R
- Grease special	■	STP additive	"	0005276 B

2 - PURPOSE

- Ensure a good operation of all mechanical moving parts.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - HOPPER

1 - Lubricate with a few drops of type ① oil the card backup plate upper guide. Move the backup plate back and forth to evenly distribute the lubricant.
Lubricate with a few drops of type ① oil the backup plate hinge point and work the oil in.

2 - Lubricate with a few drops of type ③ oil the various swinging platten articulation points and the transmission shaft bushings.

4.2. - CAMCLUTCH, LEVERS AND GEARS

1 - Put one drop of type ③ oil on the clutch pawls return spring eyelets, the pinch counterrollers and cam levers.
Lubricate, with a few drops of type ③ oil, the camclutch pawls levers.

2 – Lubricate, with one drop of type ③ oil, the clutch solenoid armature fulcrum point. Ensure that no oil creeps in the solenoid air-gap.

3 – Lubricate, with type $\boxed{2}$ grease mixed with special grease ▨, the rollers and their cams, the cam clutch circlip spring eyelets and the cam clutch solenoid command rod.

4 – Lubricate, with type $\boxed{2}$ grease mixed with special grease ▨, the cam clutch drive gears.

4.3. – FEED CLUTCH

1 – Lubricate, with special grease ▨ mixed with type $\boxed{2}$ grease, the feed clutch and feed belts driving gears.

2 – Lubricate, as above, the feed clutch hooking pawl pivot.

3 – Lubricate, with a few drops of type ③ oil, the feed clutch pawls pivoting points.

4.4. – WAITING STATION

1 – Lubricate, with type ③ oil, the swinging support axis and the eyelet of its return spring.

2 – Lubricate sparingly, with type ③ oil, the alignment roller bushing. Apply the oil from the opposite side of the clutch.

3 – Lubricate sparingly, with type ③ oil, the alignment counter roller bushing.

4 – Lubricate sparingly, with type ③ oil, the pivoting points of the cam actuating levers of the pinch rollers.

5 – Lubricate, with type $\boxed{2}$ grease mixed with special grease ▨, the alignment roller cruciform coupling.

4.5. – CARD TRACK

1 – Lubricate, with type ③ oil, the bushings of the counterrollers. The counterrollers must be dismantled as follows:
- Slacken the two roller shaft fixing screws.
- Remove the toller and its shaft from the bushing.
- Put enough oil in the inter-bushing cavity to full it.
- Replace the roller and its shaft.
- Tighten the roller shaft fixing screws leaving a slight end-play.
- Replace the counterrollers group and carry out Routine 4.26.

2 – Lubricate, with type ③ oil, the mechanical deflector bushing and the deflector solenoid armature pivoting point.

3 – Lubricate, with type $\boxed{2}$ grease mixed with special grease ■ , the extremities of the deflector command lever.

4.6. – STACKERS

1 – Lubricate, with type $\boxed{2}$ grease mixed with special grease ■ , the worm-helical driving gears.

2 – Lubricate, with a few drops of type ① oil, the upper guides of the backup plates and their guides.

3 – Lubricate, with type ③ oil, the helices shaft bushing.It is accessible through the slot in the helices.

5 – FINAL CHECKS

- Feed through some cards to remove any traces of oil from the rollers and counterrollers.

4. ADJUSTMENTS

ROUTINE : **4.1**

NAME : Cam clutch release
DURATION : 0.20 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools

2 - PURPOSE

- To ensure positive release of the cam clutch so to establish certain feed cycle start.
  With the cam clutch release solenoid energized, the stop pawl must release the stop cam and clear the cam dog profile by $\boxed{0.2 \text{ to } 0.3 \text{ mm}}$

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Slacken the solenoid mounting screws V.

2 - Move by hand the solenoid causing the armature to contact the core.

3 - Shift the stop pawl with its relative tie rod so to obtain the required clearance of $\boxed{0.2 \text{ to } 0.3 \text{ mm}}$

4 - Tighten the solenoid mounting screws.

5 - FINAL CHECKS

1 - Check out the adjustments just carried out.

2 - Check that when the solenoid is de-energized, the clutch hooks on normally upon the stop pawl.

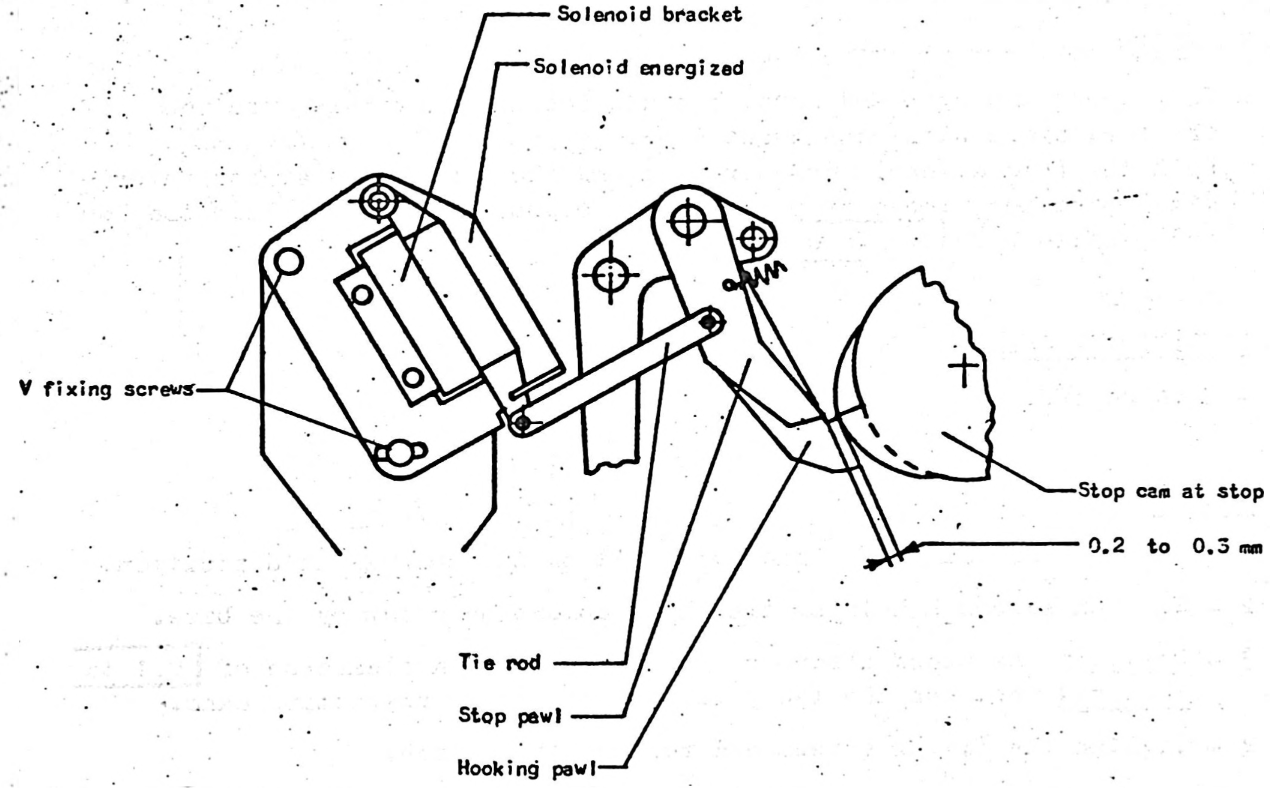

Fig. 4.1. – Cam clutch released

ROUTINE **4.2**

NAME : Cam clutch counter and stop pawls positioning
DURATION : 0.20 hr
PREREQUISITES : Routine 4.1.

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To prevent the stop and counter pawls rubbing the whole duration of the feed cycle with consequent wear.
  With the feed solenoid de-energized and the cam clutch at its intermediate position, the stop pawl and the counter pawl must clear the low cam profile by 0.1 to 0.2 mm

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Release the cam clutch and rotate it to its intermediate position.

2 - Slacken screws K holding the shock absorbing group by the base.

3 - Position the shock absorbing group to obtain a clearance of 0.1 to 0.2 mm between the two pawl tips and their respective cams.

4 - Tighten the fixing screws and restore the clutch.

5 - FINAL CHECKS

1 - Check out the adjustments just carried out.

2 - Check that when the solenoid is de-energized, the clutch hooks on normally upon the stop pawl.

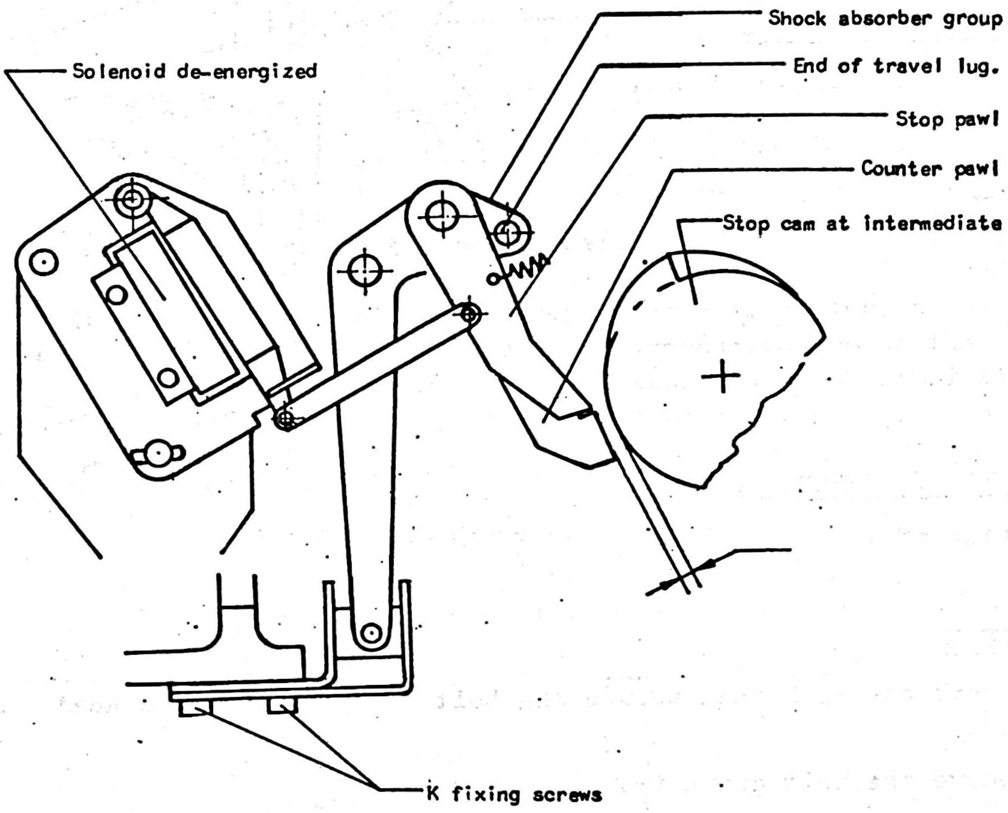

Fig. 4.2. - Counter and stop pawls positioning

ROUTINE : **4.3**

NAME : Feed belt tension
DURATION : 0.10 hr
PREREQUISITES : Routine 2.1 step 4.3.

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To obtain uniform and parallel advance of a card when drawn from the hopper.
  The belts must be tightened by means of their respective idlers and must not be over-stressed. An uniform tension between the two feed belts is to be maintained.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Remove screws Z that secure the belt group to the feed head assembly.

2 - Remove the belt group from its housing.

3 - Slacken the two belt tensioning idlers, acting on screws T.

4 - Take up any slack on the belts uniformly. Tighten screws T.

5 - Insert the group and tighten the Allen head Z screws.

5 - FINAL CHECKS

- Check out the adjustment just carried out.

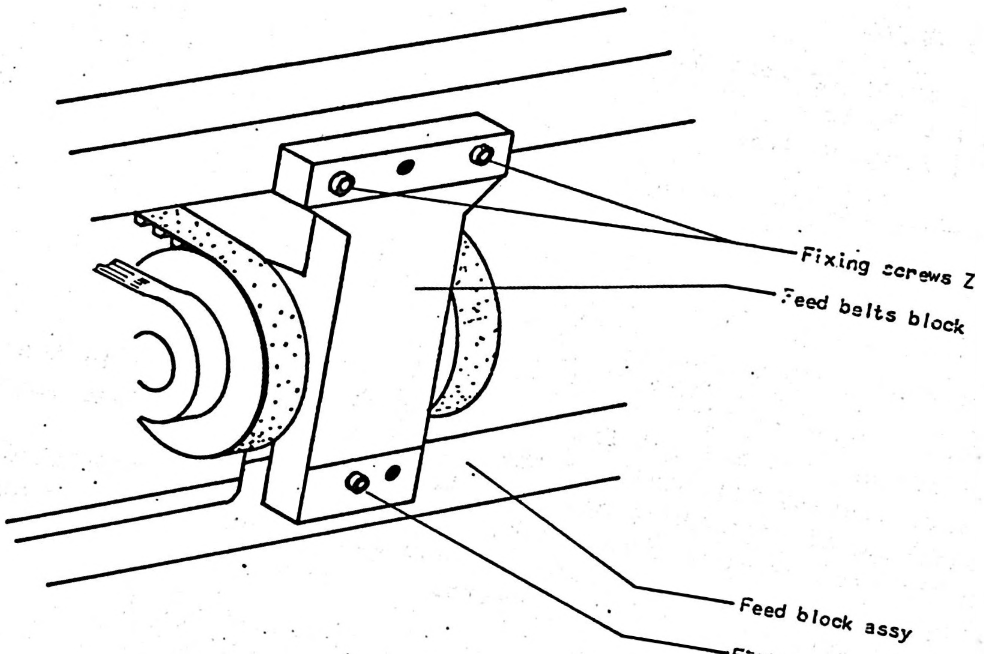

Fig. 4.3. - Feed belts block

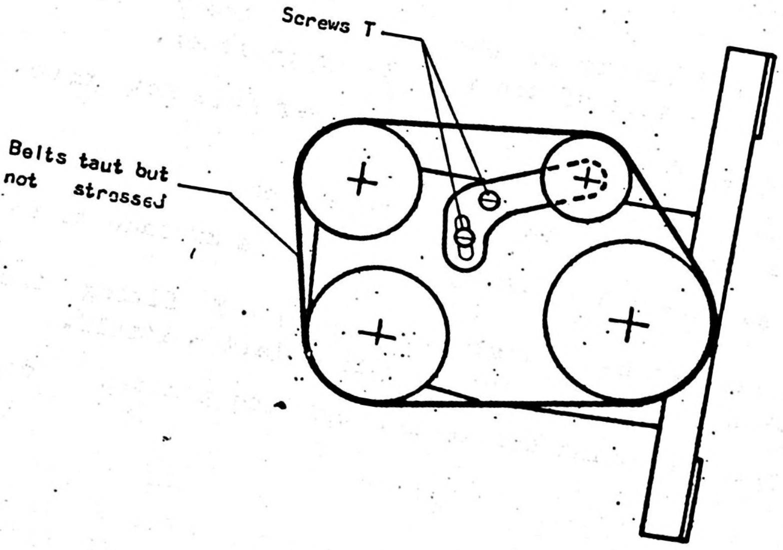

Fig. 4.4. - Feed belt adjustment

ROUTINE : **4.4**

NAME : Swinging feed platten
DURATION : 0.20 hr
PREREQUISITES : Routine 4.3.

1 – TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 – PURPOSE

- To ensure correct and jam free card feed from the hopper to the pinch rollers, thereby forestalling the possibility of wrong feed sequences or buckling of cards onto the throat.
  With the feed cam's P index mark, coincident with the feed lever follower, the swinging feed platten plane must be on the same plane as the front surface of the feed belts.

3 – PRELIMINARY CHECKS

- Machine off.

4 – PROCEDURE

1 – Release the feed clutch and rotate the camshaft until the P index mark is coincident with the axis of the feed lever follower.

2 – Ensure that screw T is tight and that the feed lever does not move on its shaft.

3 – Loosen the screws V securing the two feed platten command levers.

4 – Bring the feed belt surface and swinging feed platten surface to be on the same plane.
If this requirement can not be met, slacken screws Z fixing the lower leaf spring which acts as a hinge for the platten itself.

5 – Tighten the leaf spring securing screws and the feed platten command lever screws.

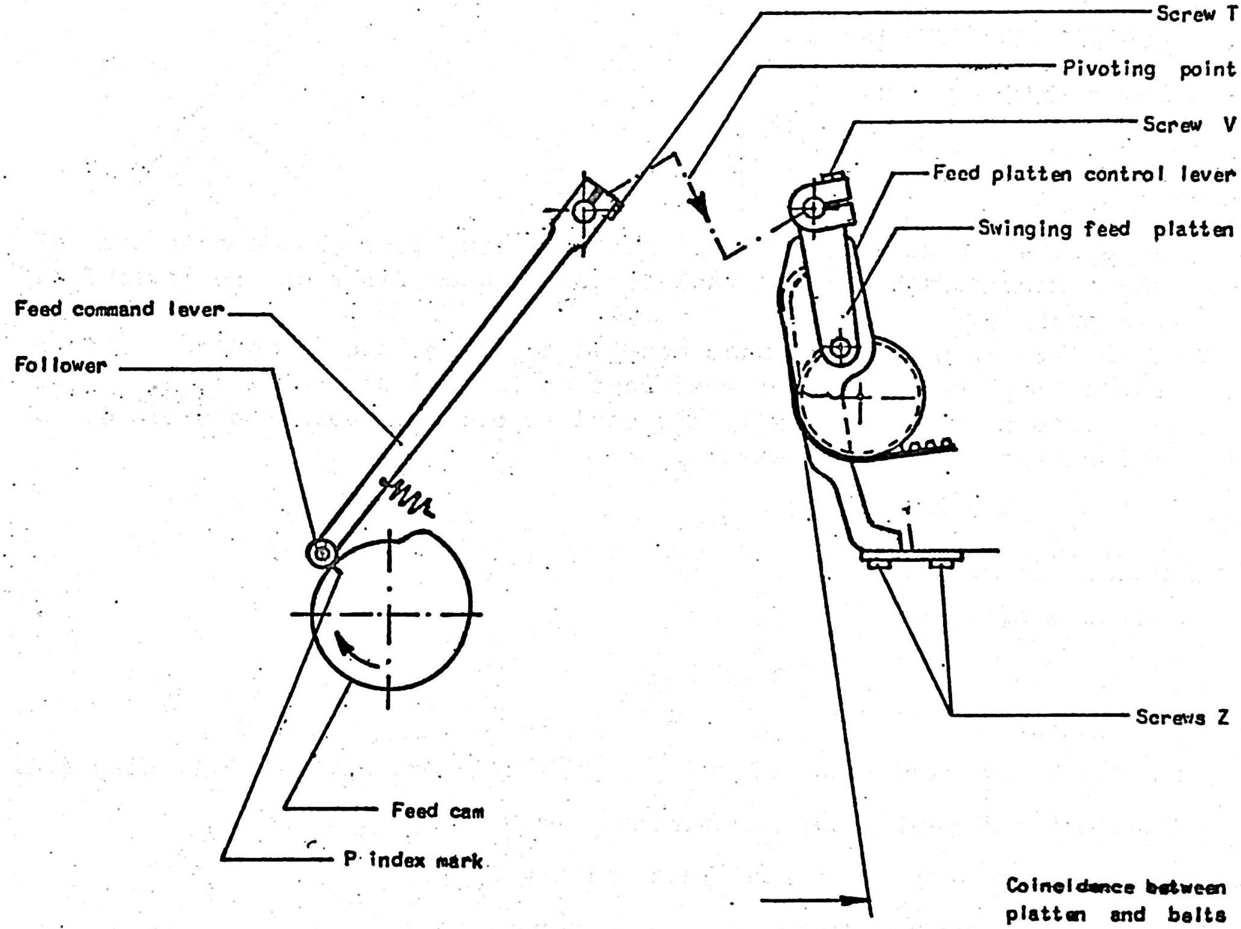

Fig. 4.5. - Swinging feed

5 - FINAL CHECKS

- Check the adjustment done by turning the cam shaft one full revolution. At check out end, hook up the clutch.

ROUTINE : **4.5**

NAME : Feed cam release
DURATION : 0.10 hr
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

- Engineer's tool kit.

2 – PURPOSE

- To ensure positive feed clutch release when, through the rotation of the camshaft, the command pawl lever follower falls on the lower feed cam profile.
  With the cam and feed clutch coupled together, the tip of the feed clutch pawl command lever must rest on the end of travel stud. No pressure must be exerted by the stud in order to avoid possible displacement of the pawl itself.

3 – PRELIMINARY CHECKS

- Machine off.

4 – PROCEDURE

1 – Check the adjustment of the swinging platten. Routine 2.1. step 4.4.

2 – Check the pawl group adjustment. See Routine 4.6.

3 – Slacken the pawl command lever fixing Z screw.

4 – Position both clutches at the stop position.

5 – Near the pawl command lever tip to the stud on the pawl itself, without applying any pressure. Tighten screw Z on the pawl command lever.

6 – Release the cam clutch by means of the feed solenoid. Slowly rotate the cam group to bring the feed command lever follower onto its lower cam profile. Check that in this condition the pawl frees the hooking cam with a functional tolerance of at least $\boxed{\text{2 mm}}$.
If the adjustment is not achieved repeat operations as from point 2.

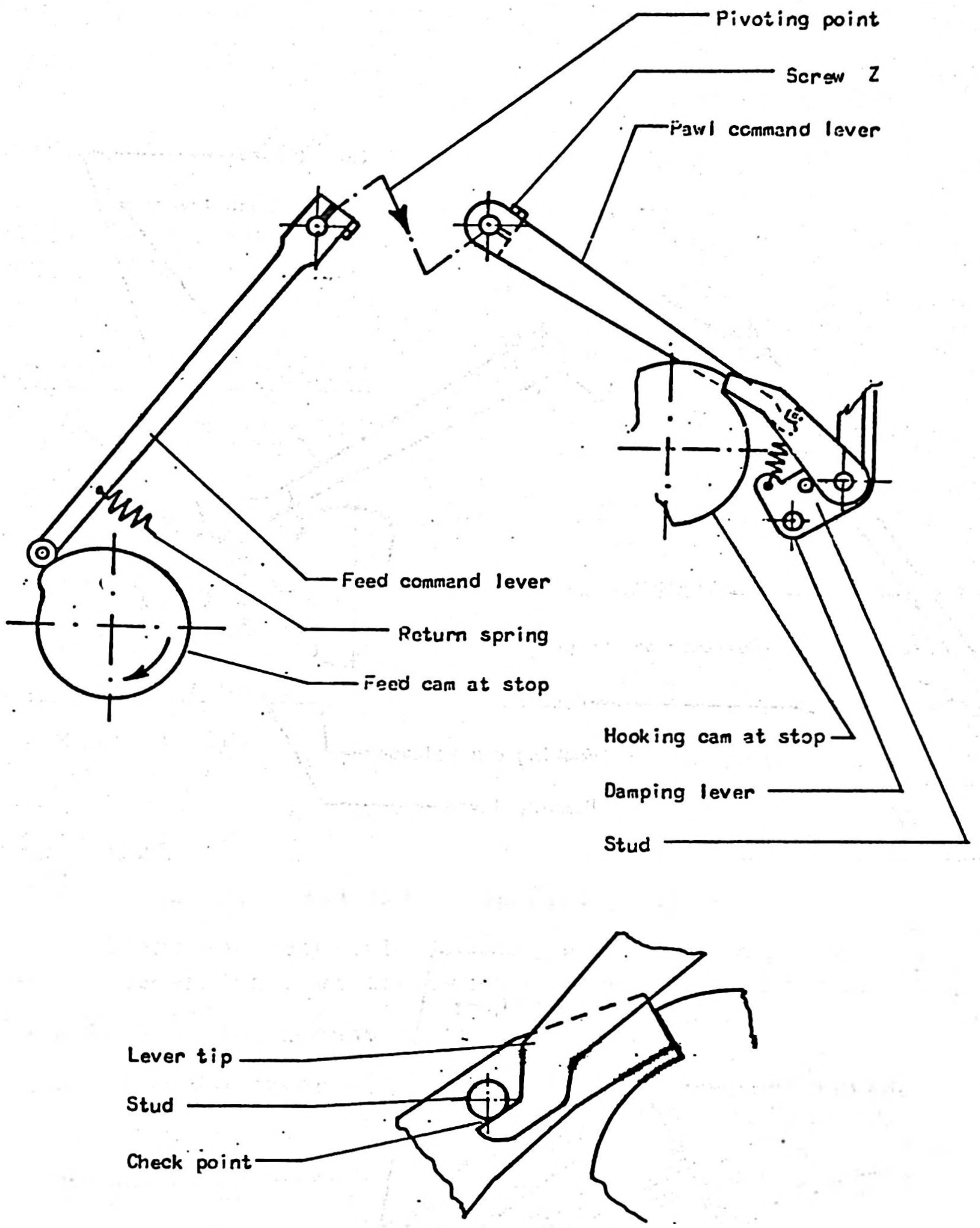

Fig. 4.6. – Feed clutch engaged

5 – FINAL CHECKS

- Hook up the clutches and check out the adjustment.

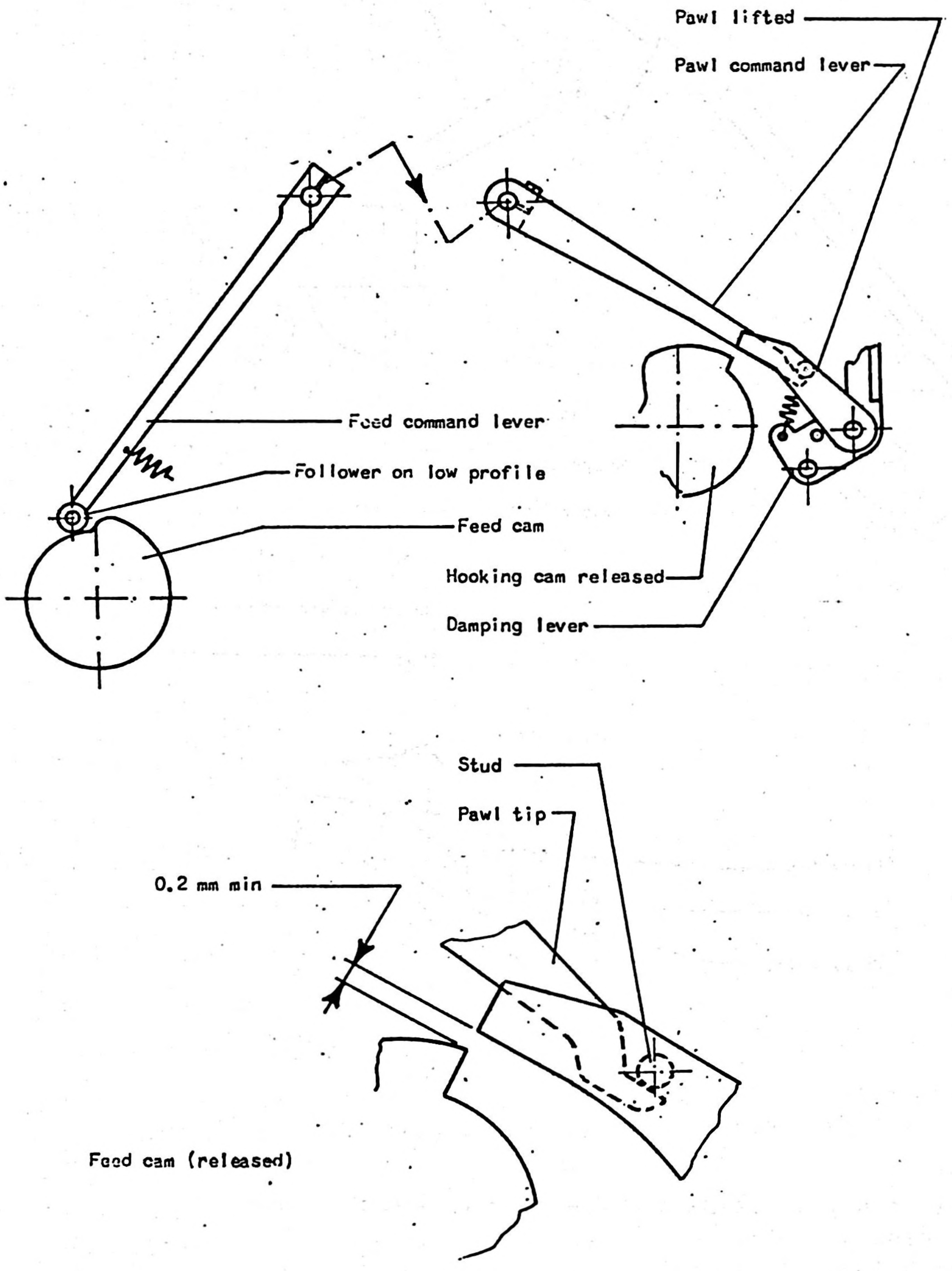

Fig. 4.7. – Feed clutch released

ROUTINE : **4.6**

NAME : Pawl group adjustment
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Engineer's tool kit

2 - PURPOSE

- To avoid excessive pawl wear and ensure correct engagement.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Loosen the eccentric group fixing screw.

2 - Adjust the eccentric in order to obtain a gap of $\boxed{0.15 \pm 0.05 \text{ mm}}$ between the pawl tip, catch and respective cams. See fig. 4.8.

3 - Tighten the eccentric fixing screw.

4 - Check the upper clutch release adjustment as per Routine 4.5.

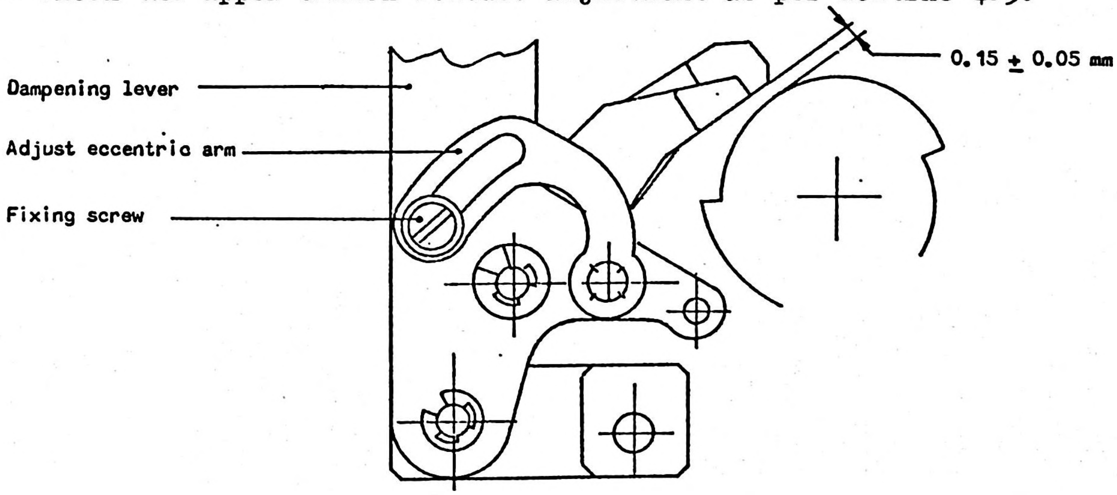

Fig. 4.8. - Dampening Lever

5 - FINAL CHECKS

- Check that the set gap has not altered.
- Feed some cards through and check for a correct cam release.

ROUTINE : **4.7**

NAME : Throat
DURATION : 0.10 hr
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 – PURPOSE

- To obtain regular and uniform passage of cards. These must flow one at the time from the hopper to the waiting station.
  The throat gap must be parallel throughout its length and within 0.20 and 0.25 mm

3 – PRELIMINARY CHECKS

- Machine off.

4 – PROCEDURE

1 – Slacken the two screws holding the horizontal knife.

2 – Slacken the screw holding the vertical knife.

3 – Move the adjusting eccentric to bring the horizontal knife under the vertical knife. Tighten the horizontal knife screws.

4 – Keeping the vertical knife fully butting up against the horizontal knife, tighten the fixing screw.

5 – Slacken the horizontal fixing screws. Turn the eccentric until a slight drag is felt on a 0.25 mm feeler gauge.

6 – Tighten the horizontal fixing screw and remove the feeler gauge.

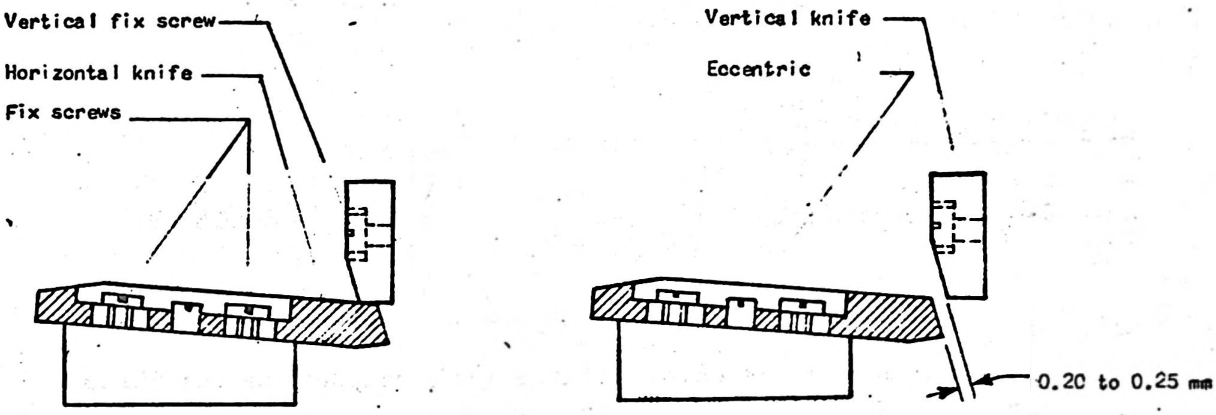

Fig. 4.9. – Throat adjustment

5 – FINAL CHECKS

1 – Ensure that the 0.25 mm feeler gauge enters the throat gap with a slight drag.

2 – Check that a 0.20 mm feeler gauge goes through without difficulty.

3 – If the above requirements are not met, repeat the adjustment procedure.

ROUTINE : **4.8**

NAME : Front slide plate
DURATION : 0.10 hr
PREREQUISITES : Routine 4.7.

1 - TOOLS AND INSTRUMENTS

- Tool kit
- Slide adjusting tool P.N. 0688051 D

2 - PURPOSE

- To establish a correct card attitude with respect to the throat entrance.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Slacken the two front slide fix bolts an pull it away from the throat.

2 - Place the adjusting tool up and square with the throat.

3 - Push the tool hooked onto the slide until they butt against the vertical knife. Tighten the fixing bolts.

5 - FINAL CHECKS

1 - Check that the slide plate is located beyoud the throat edge by about 1 mm.

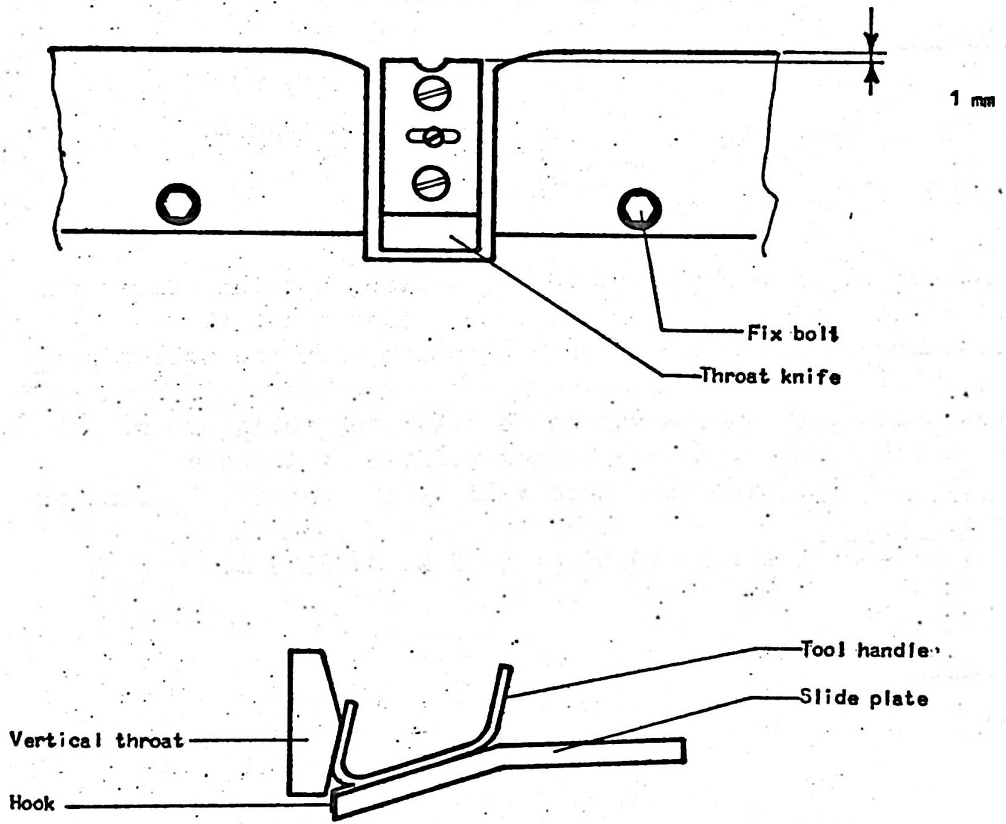

Fig. 4.10. – Slide plate adjustment

ROUTINE : 4.9

NAME : Alignment roller
DURATION : 0.20 hr
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

- Tool kit
- GO-NO-GO gauge P.N. 0688773 L

2 – PURPOSE

- To establish correct card transport to the waiting station from the hopper causing the card to drop on the lower reference bar.
  To allow, furthermore, the correct card ejection when the roller withdraws.
  Position the camshaft in such a way as to place the follower of the eject roller command lever, at the bottom profile of the cam.
  The roller must be withdrawn the fixed wall of the waiting station from 0.3 to 0.6 mm
  This check is done with the GO-NO-GO gauge P.N. 0688773 L.

3 – PRELIMINARY CHECKS

- Machine off.

4 – PROCEDURE

1 – Release the cam clutch and rotate the camshaft until the follower of the command lever is in the lower alignment cam profile.

2 – Slacken the eccentric on the alignment cam and rest the "MIM" side of the gauge on the waiting station wall surface, in line with slot from which the alignment roller protrudes.

3 – Turn the eccentric to cause the roller to bear slight pressure on the gauge surface.

4 – Tighten the eccentric.

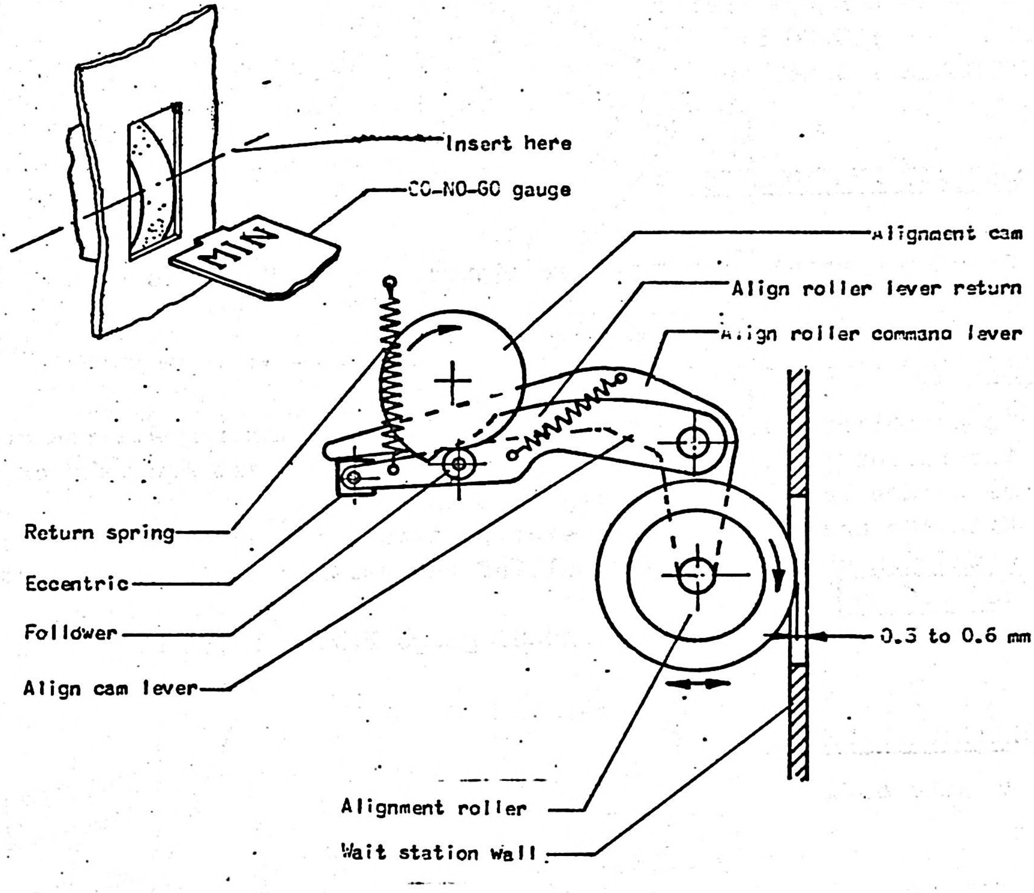

Fig. 4.11. - Alignment roller adjustment

5 - FINAL CHECKS

1 - Rotate the camshaft one full revolution and check the adjustment.

2 - Bring both clutches to the stop position.

ROUTINE : **4.10**

NAME : Eject roller
DURATION : 0.20 hr
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

– GO–NO–GO gauge	P.N. 0688773 L
– Spanner special, eject roller adjust	" 0688798 L

2 – PURPOSE

– To establish correct card ejection from the waiting station and, when the roller is withdrawn, to allow the card to sit squarely on the lower reference bar of the waiting station.
With the cam clutch at the stop position, the eject roller must be withdrawn under the fixed wall of the waiting station by about 0.3 to 0.6 mm
This check is done with GO–NO–GO gauge P.N. 0688773 L.

3 – PRELIMINARY CHECKS

– Machine off.

4 – PROCEDURE

1 – Set the cam clutch to the stop position.

2 – Insert spanner P.N. 0688798 L from the underside of the machine base. Slacken the eccentric lock nut.

3 – Rest the "MIN" side of the GO–NO–GO gauge on the waiting station wall in line with the slot through which the eject roller protrudes.

4 – Turn the eccentric with the spanner until a slight pressure is felt on the gauge through the action of the roller.

5 – Tighten the eccentric lock nut.

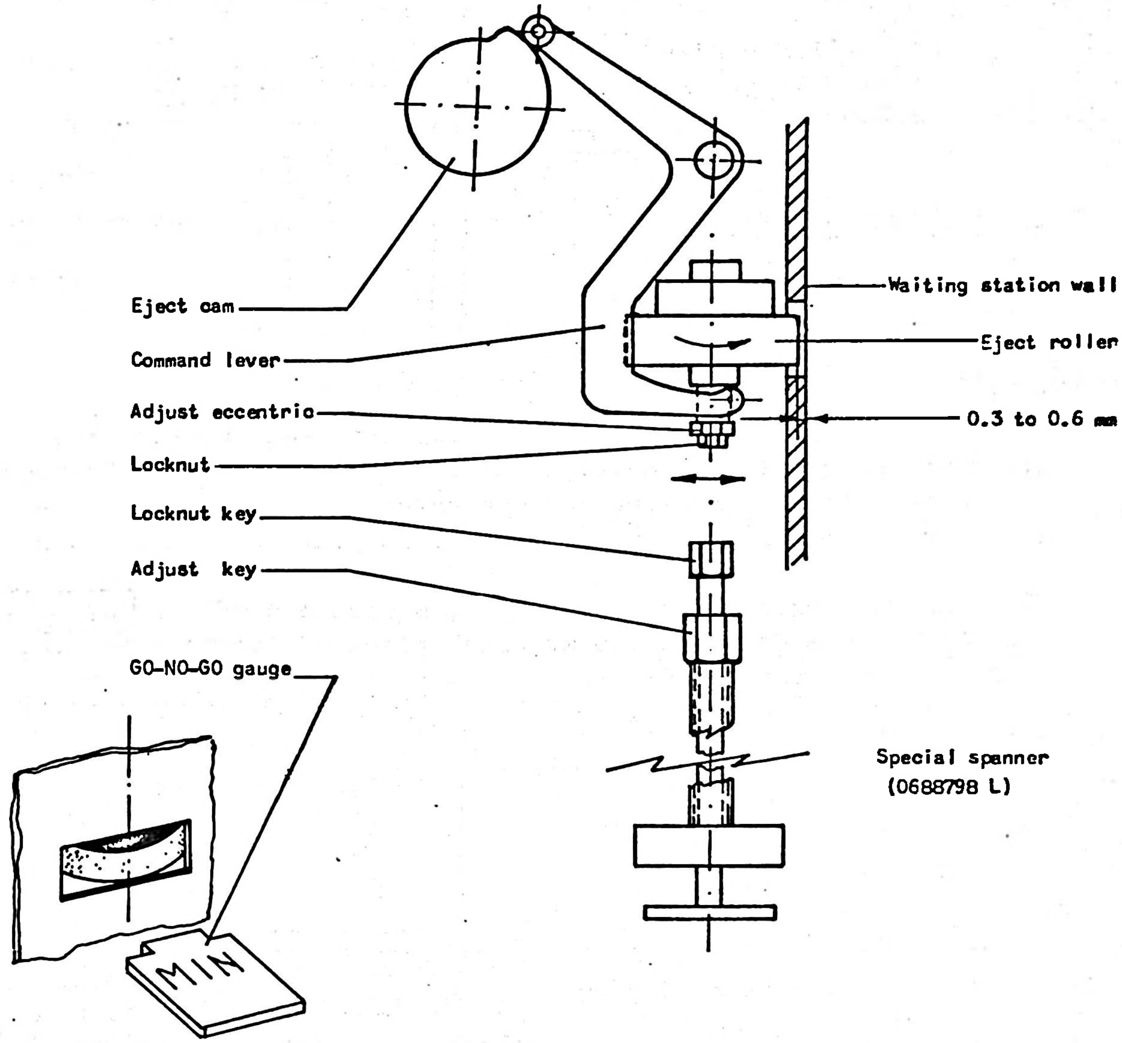

Fig. 4.12. - Eject roller adjustment

5 - FINAL CHECKS

1 - Rotate the camshaft one full revolution and re-check the adjustment.

2 - Bring both clutches to the stop position.

ROUTINE : 4.11

NAME : Waiting station door
DURATION : 0.10 hr
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

– Tool kit and system tools.

2 – PURPOSE

– To ascertain the physical dimensions of the area in which the card lines up before it is ejected towards the read head. Simultaneously to ensure the correct pressure and due safety of operation to the align and eject counterrollers and to the first pair of track counterrollers.
With the waiting station door closed, a distance of 47 ± 0.1 mm must be measured between the external plane of the door and the outer surface of the read head.

3 – PRELIMINARY CHECKS

– Machine off.

4 – PROCEDURE

1 – Set up a depth vernier gauge to read 47 ± 0.1 mm

2 – With the waiting station door closed, measure the distance between the read head and door's external surfaces. See figs. 4.13 and 4.14.

3 – If the measurement is not obtained unlock the eccentric lock nut and by turning the eccentric reach the required distance.

4 – Tighten the eccentric lock nut.

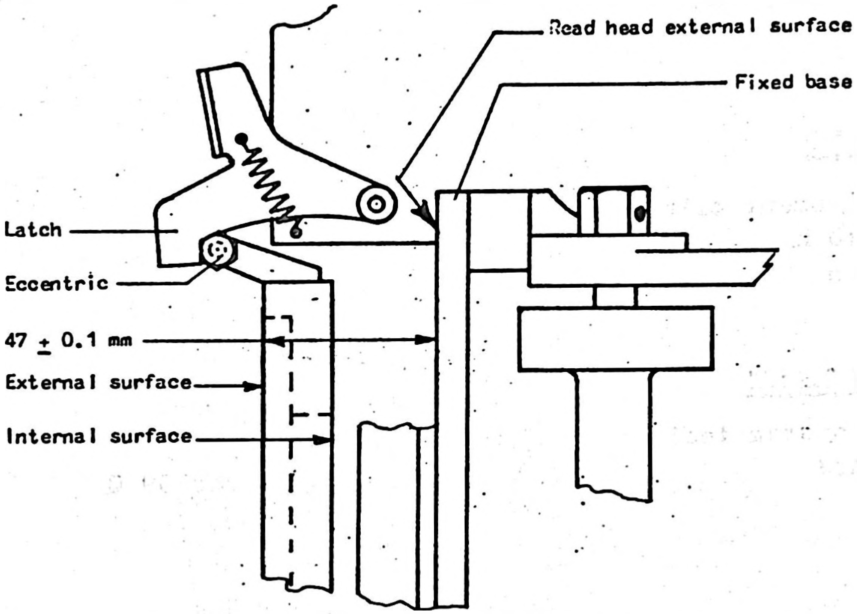

Fig. 4.13. - Waiting station closed

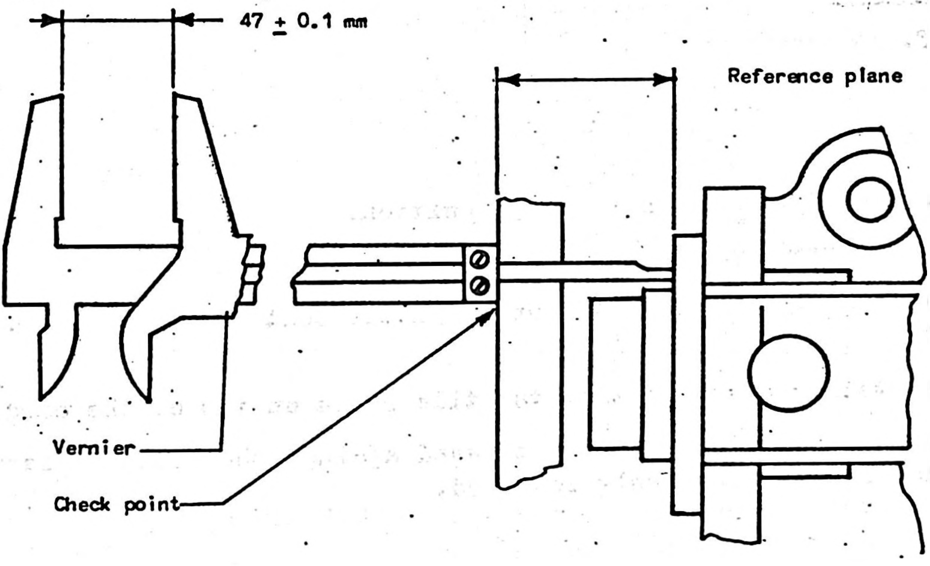

Fig. 4.14. - Measuring the distance

5 - FINAL CHECKS

1 - Open and shut the waiting station door and check the adjustment.

ROUTINE : **4.12**

NAME : Alignment tile
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools
- Test metal card P.N. 0688799 Q

2 - PURPOSE

- To obtain a precise card alignment in the waiting station to ascertain correct reading when the card presents itself under the read head.
- No deformation or play must be encountered when the metal test card is introduced into the waiting station.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Set up both clutches to their stop position.

2 - Slacken the screw that fix the card alignment tile.

3 - Introduce into the waiting station the metal test card, Part Number 0688799 Q.

4 - Close the station ensuring that the tile rests on top of the card.

5 - While keeping the tile uniformly pressed against the metal card, tighten the screws previously loosened.

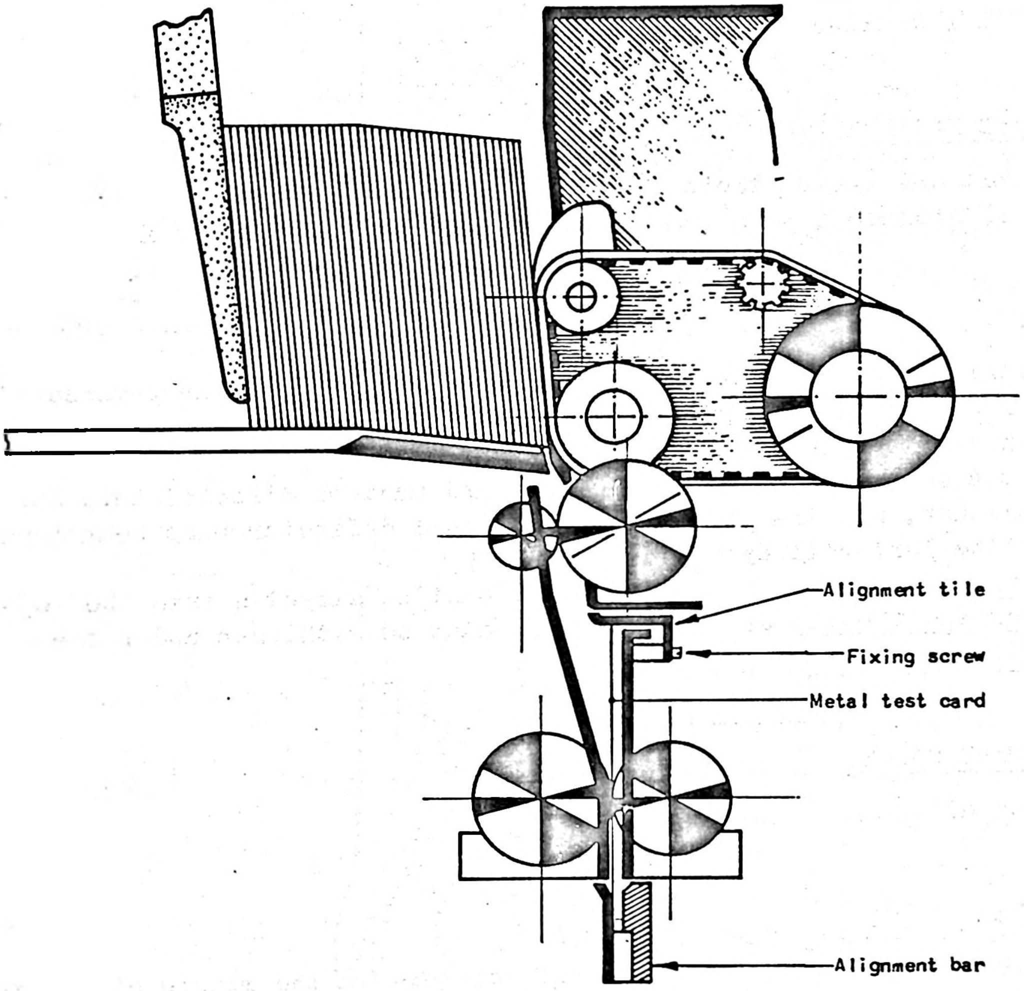

Fig. 4.15. – Alignment tile positioning

5 – FINAL CHECKS

– None.

ROUTINE : **4.13**

NAME : Mechanical deflector
DURATION : 0.10 hr
PREREQUISITES : Routine 4.19.

1 – TOOLS AND INSTRUMENTS

- Tool kit and system tools
- Special spanner P.N. 0688797 X

2 – PURPOSE

- To obtain selective stacking of cards depending upon the physical position of the deflector and to minimize the dead time between one condition and the other.
  With the solenoid de-energized, the card must be directed into the normal stacker, and the tip of the mechanical deflector must be withdrawn under the left rail by 0.3 to 0.6 mm
  With the solenoid energized the card must be directed into the eject stacker and the tip of the deflector must be withdrawn under the right by 0.3 to 0.6 mm

3 – PRELIMINARY CHECKS

- Machine off.

4 – PROCEDURE

1 – Slacken screws T and position the solenoid in the middle of the screw slot. Tighten the screws.

2 – Energize the solenoid. Slacken screw V with special spanner N° 0688799 X and position the deflector so that its tip withdraws under the right rail by 0.3 to 0.6 mm Tighten screw V.

3 – De-energize the solenoid. Slacken screw Z which locks the armature travel limiting eccentric.

4 – Turn the eccentric up against the solenoid armature and adjust it to have the deflector tip protruding from the left rail by 0.3 to 0.6 mm

5 - Tighten the eccentric lock screw.

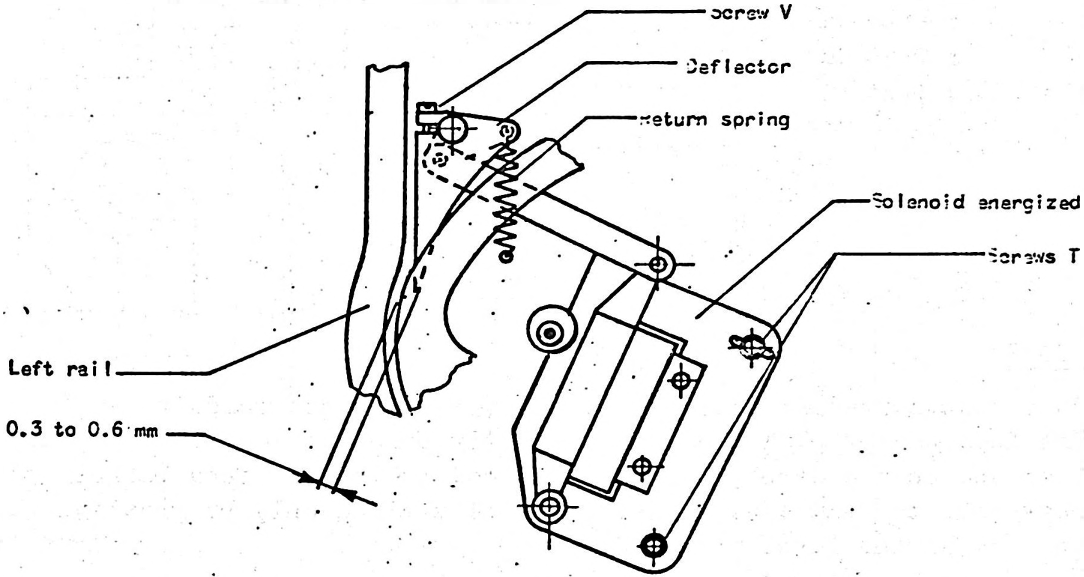

Fig. 4.16. - Mechanical deflector - eject

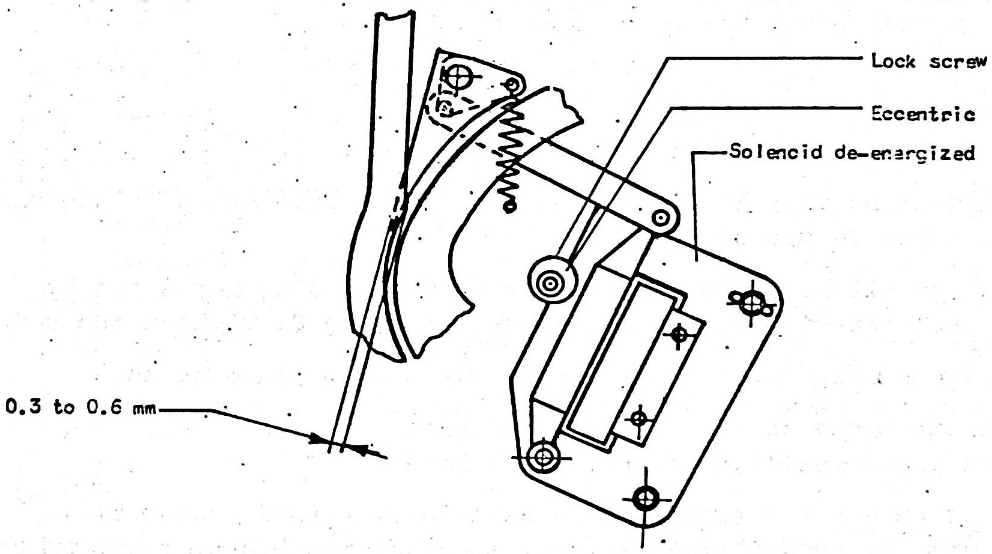

Fig. 4.17. - Mechanical deflector - normal

5 - FINAL CHECKS

1 - Check out the adjustment done.

2 - Apply power to the machine and feed through the deflector diagnostic test and check for operation.

ROUTINE : 4.14

NAME : Feed backup plate
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To obtain correct card feed, right up to the last card. The feed backup plate must be perfectly parallel to the feed hopper base and on the same plane of both feed belts. The feed backup plate must come to rest against the feed belts aided only by gravity, independent of the level released.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Position both clutches in the stop position.

2 - Check that no play is present on the lower guide and that the plate is parallel to the hopper base.

3 - If not parallel, loosen the roller bracket fixing screw and by moving the bracket, obtain requirements of step 2. Tighten the screws.

4 - Slightly slacken screws Z securing the backup plate guide.

5 - Cause the plate to contact the feed belts and, while exerting a slight pressure, tighten the fixing screws.

6 - Place a card strip between each belt and the feed packup plate. Pull out the card strips, without touching the backup plate and check that the force required is the same for both.

7 - If this requirement is not satisfied, repeat operations as from step 4.

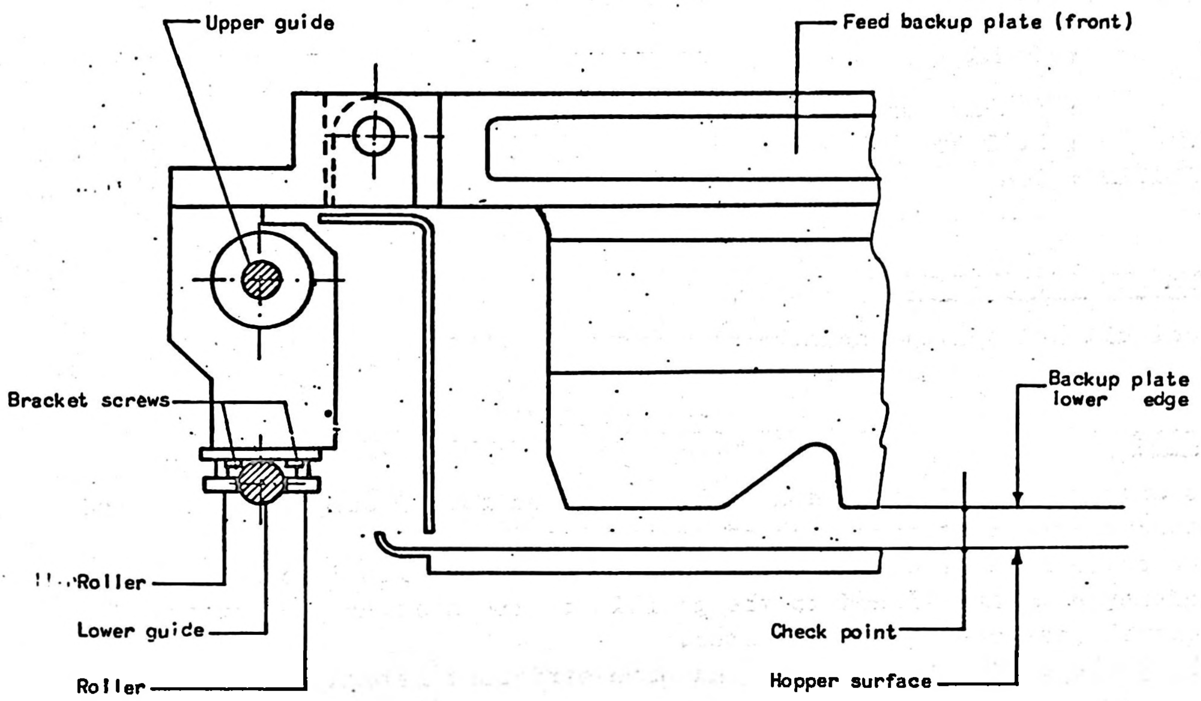

Fig. 4.18. – Feed backup plate view

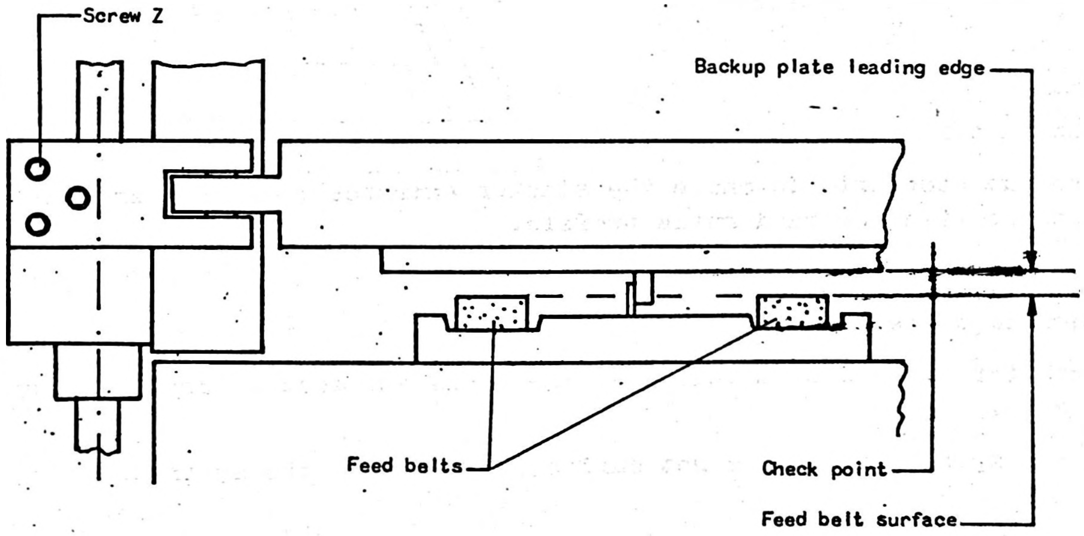

Fig. 4.19. – Feed backup plate adjustment

5 – FINAL CHECKS

– Check for smooth running throughout travel.

ROUTINE : 4.15

NAME : Stacker entrance pawls
DURATION : 0.10 hr
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 – PURPOSE

- To obtain the entering card to bound on the rubber damping pad and stack on the left hand side of the stacker.
  The outer stacker entrance pawls must be so positioned to have their reference marks aligned to the profile of the stacker card guide. The central pawl can not be adjusted.
  All pawls must rotate freely and have efficient return springs.

3 – PRELIMINARY CHECKS

- Machine off.

4 – PROCEDURE

1 – Slacken off the eccentric's lock nut.

2 – Move the eccentric to cause the stacker entrance pawl reference mark coincide with the card guide profile.

3 – Tighten the locknut.

4 – Check adjustment.

5 – Check for freedom of movement of the pawls and good return spring tension.

6 – If the spring tension is not sufficient, replace the springs.

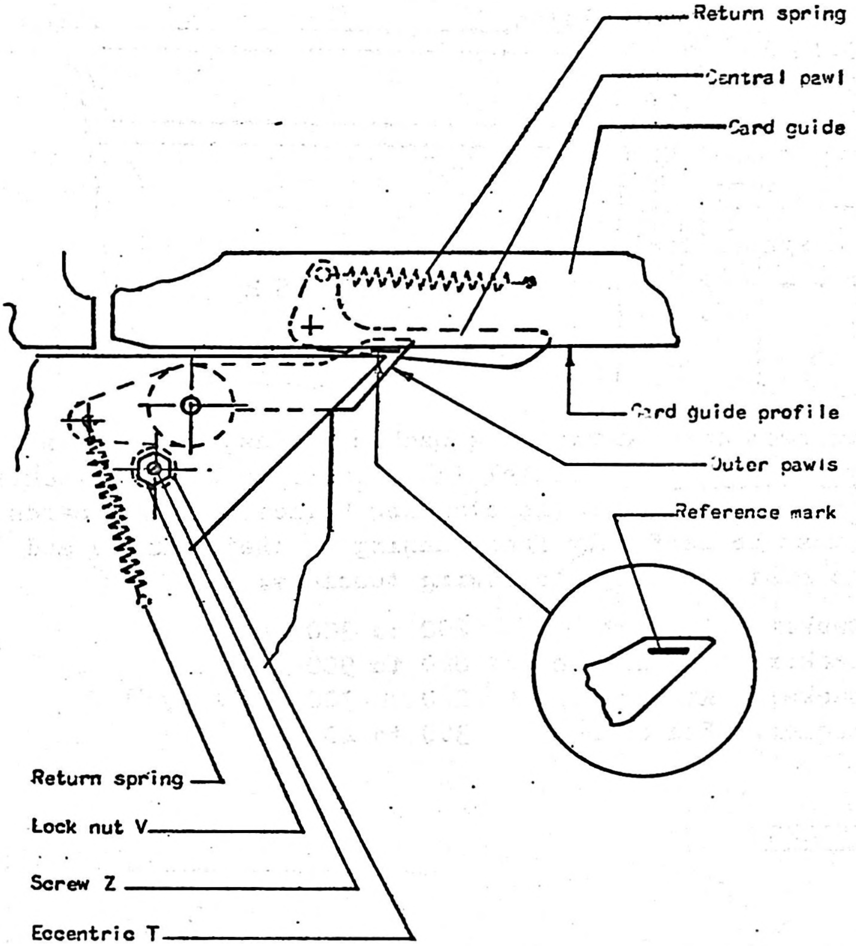

Fig. 4.20. – Stacker entrance pawls

5 – FINAL CHECKS

– None.

ROUTINE : **4.16**

NAME : Stacker backup plates
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools
- Dynamometer 0 - 1 Kg P.N. 4355415 R

2 - PURPOSE

- To ensure correct card packing the backup plates, both normal and eject, must be perfectly parallel to the surface of the stackers. They must be 5 to 7 mm from the stacking helices with no cards present. The plates must be perfectly free-running on their guides and the return springs must exert the following tensions:

- Normal stacker.	At rest	200 to 300 gr
- Normal stacker.	End of run	800 to 900 gr
- Eject stacker.	At rest	200 to 300 gr
- Eject stacker.	End of run	300 to 400 gr

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Check that the sliding support has no play on its lower guide and that it is parallel to the stacker surface.

2 - Any adjustments are made by slackening screws T and moving the support to the position required. Tighten the screws.

3 - Slacken the 3 Z screws that fix the plate to the sliding support.

4 - Tighten the screws with the plate 5 to 7 mm from its packing helix.

5 - Check adjustments and for free running of the plates on the guides.

6 - Check return spring tension with dynamometer on point M. Replace if not within specifications.

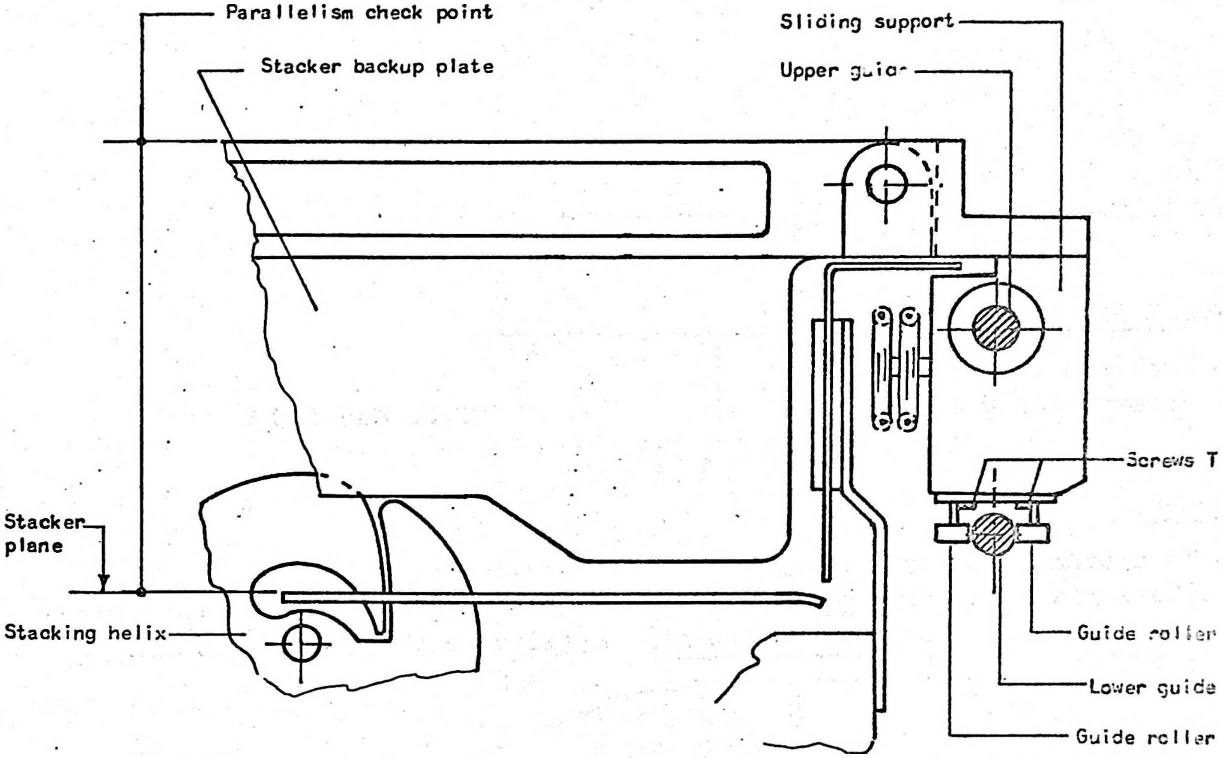

Fig. 4.21. – Stacker backup plate view

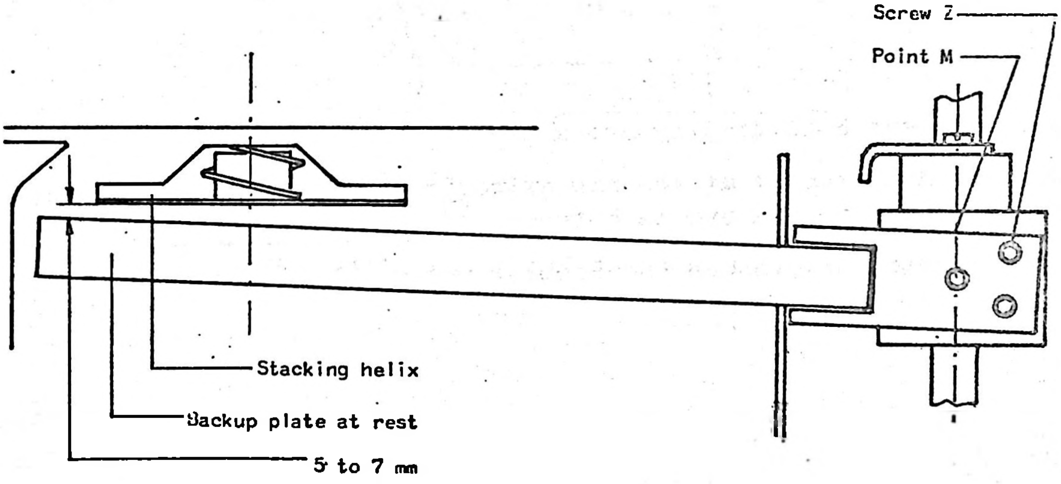

Fig. 4.22. – Stacker backup plate adjustment

5 – FINAL CHECKS

- Apply power to the machine and feed through the Mechanical Deflector diagnostic test and check card stacking.

ROUTINE : **4.17**

NAME : Read head arm damping
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools
- Synamometer 0 - 1 Kg P.N. 4355415 R

2 - PURPOSE

- To prevent the read head falling and damaging itself.
The force necessary to lower the read head damping arm, from the raised position, must be 600 to 700 gr applied to the tip of the arm itself.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Place the read head damping arm uppermost.

2 - Apply the dynamometer at the arm extremity and check that the force necessary to move the arm is between 600 and 700 gr .

3 - Either tighten or slacken the damping nut to obtain value required.

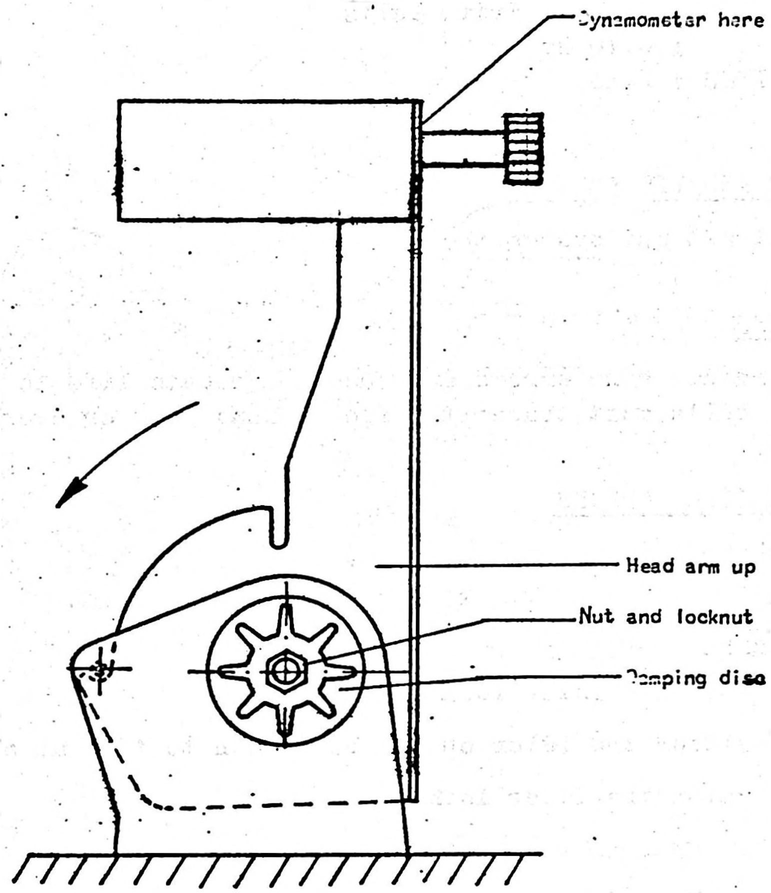

Fig. 4.23: – Read head damping arm

5 – FINAL CHECKS

- None.

ROUTINE : **4.18**

NAME : Toothed drive belts
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To reduce sync errors and ensure adequate life to the belts. All belts must transmit drive without whip or overloads.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Loosen the idler lock screw.

2 - Position the idler on the belt such to take up all slack.

3 - Tighten the idler lock screw.

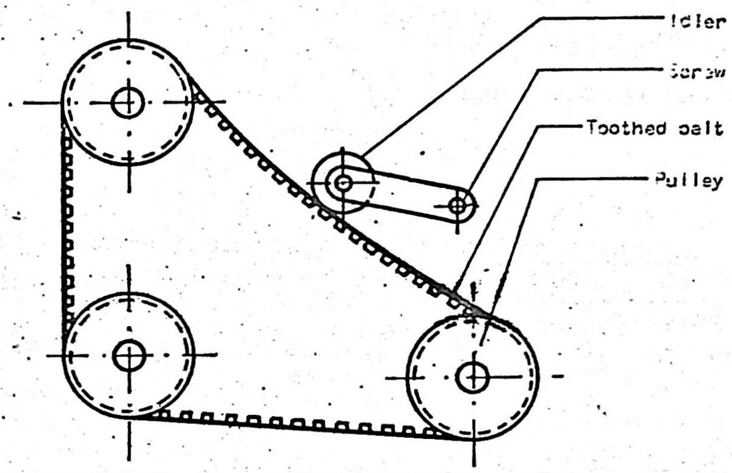

Fig. 4.24. – Toothed **drive belts**

5 – FINAL CHECKS

- Check that the toothed belt is not overtaut.

ROUTINE : **4.19**

NAME : Card guide rails
DURATION : 0.20 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To correctly guide the cards from the read station to the stackers. A gap of $\boxed{0.5 \pm 0.1 \text{ mm}}$ must be present between the drive rollers and the guide rails. A distance of $\boxed{0.8 \pm 0.1 \text{ mm}}$ must exist between two rails.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Slacken off the rails fixing bolts.

2 - Position the rail opposite the interested rollers to obtain the required distance $\boxed{0.5 \pm 0.1 \text{ mm}}$

3 - Tighten the slackened bolts.

4 - With feeler gauges,position the opposite rail to be at a uniform distance of $\boxed{0.8 \pm 0.1 \text{ mm}}$ for all of its length.

5 - Tighten the interested fixing bolts.

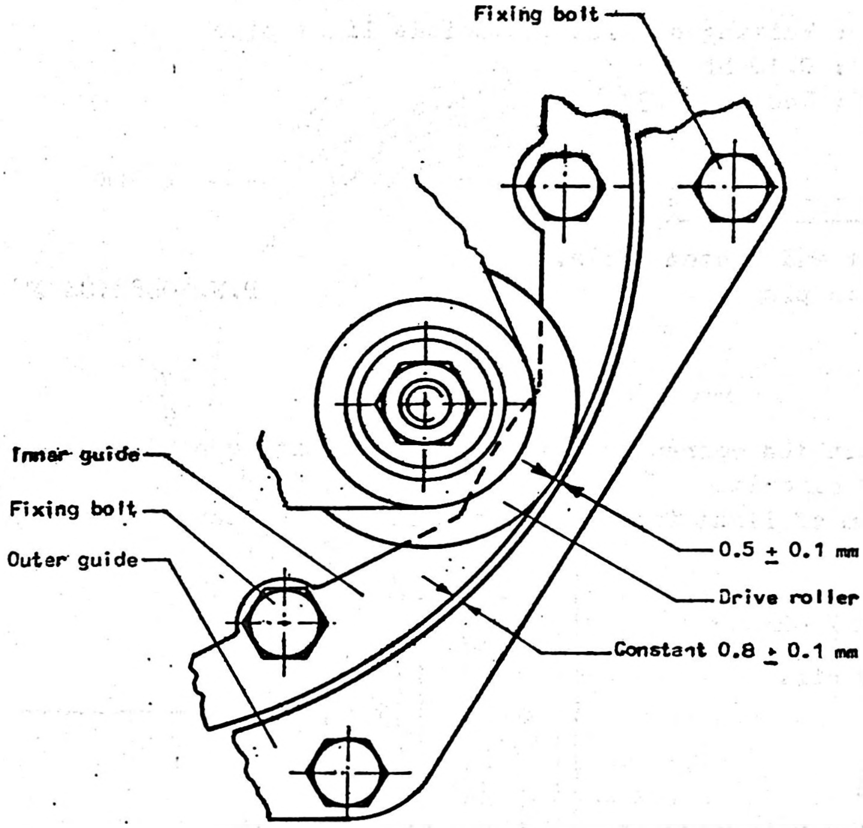

Fig. 4.25. – Card guide rails

5 – FINAL CHECKS

– Check that the rollers to rail and inter-rail distances are as specified.

ROUTINE : **4.20**

NAME : Waiting station photodiode light pipe
DURATION : 0.10 hr
PREREQUISITES : Routine 4.31. and 4.11.

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.
- Reference pin P.N. 0688104 A

2 - PURPOSE

- To obtain the correct operation of the waiting station photodiodes amplifier circuit.
  The beam of light from light pipe must be centered on the photodiode.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Fit the reference pin to light pipe support.

2 - Slaçken screws Z and T as show in figure.

3 - Center the reference pin tip in the orifice of the photodiode block.

4 - Tighten screws Z and T.

5 - Remove the reference pin and insert the light pipe to have the end surface in contact with the base of the support hole. See fig. 4.26.

6 - Check that with the Machine ON, the beam from the light pipe is centered on the photodiode.

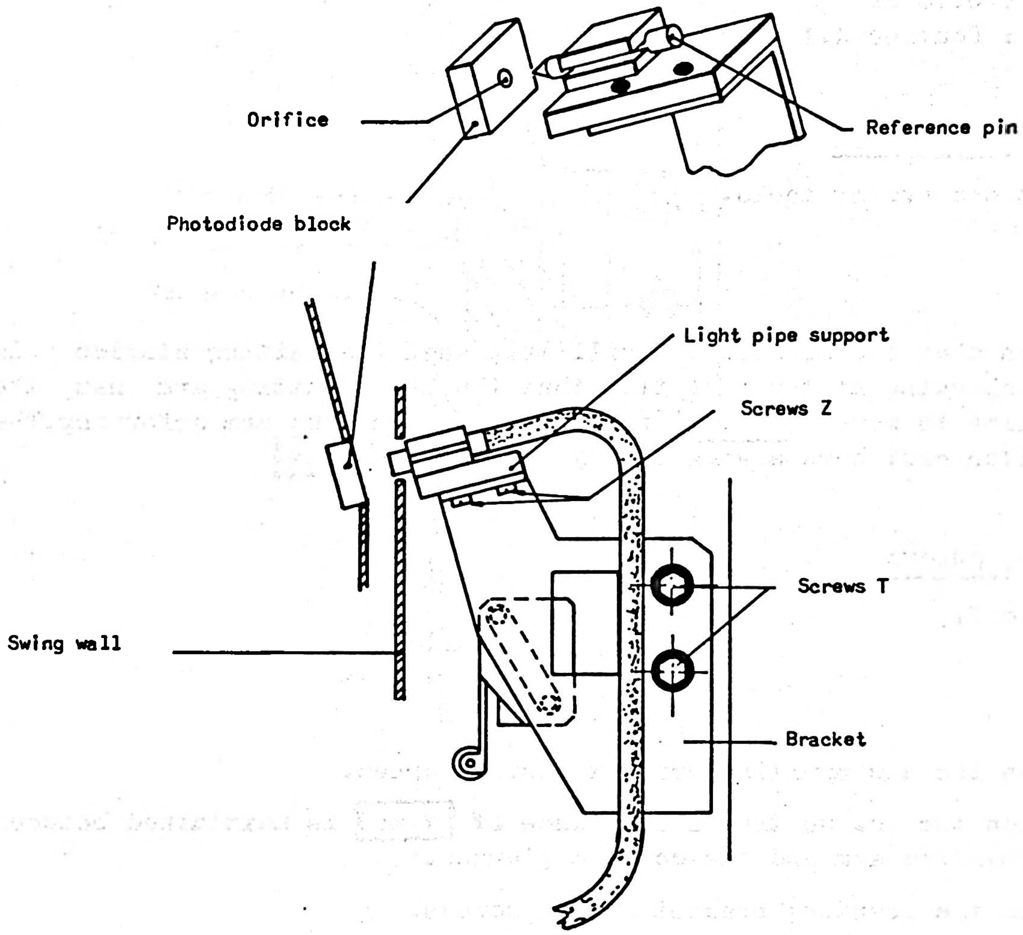

Fig. 4.26. – Waiting station light pipe

5 – FINAL CHECKS

– None.

ROUTINE : **4.21**

NAME : Waiting station microswitch
DURATION : 0.10 hr
PREREQUISITES : Routine 4.11 and 4.20.

1 – TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 – PURPOSE

- To ensure that the microswitch will trip when the waiting station is closed, checking at the same time that the msw actuating arm has the possibility to move 1 mm forward to prevent the arm deforming. The microswitch must have a work safety margin of 1 mm

3 – PRELIMINARY CHECKS

- Machine off.

4 – PROCEDURE

1 – Slacken the msw mounting bracket fixing screws.

2 – Position the msw so that a clearance of 1 mm is maintained between the actuating arm and the command plunges.

3 – Tighten the mounting bracket fixing screws.

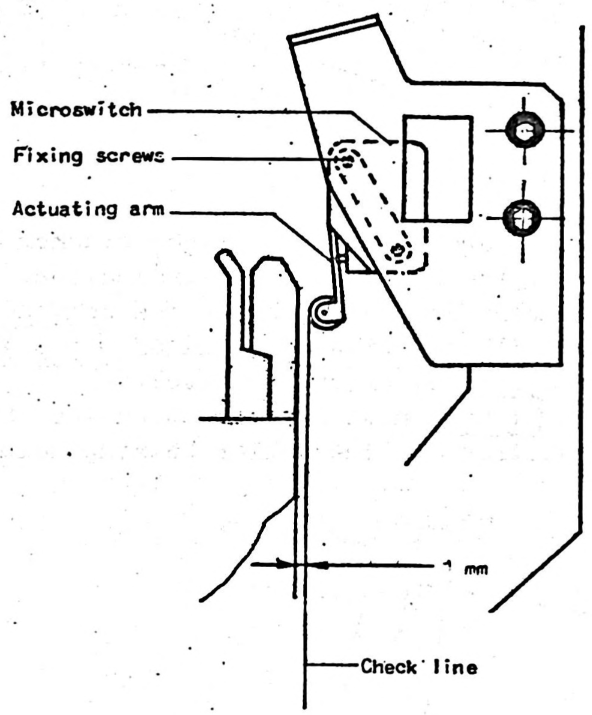

Fig. 4.27. – Waiting station msw

5 – FINAL CHECKS

- None.

ROUTINE : **4.22**

NAME : Stacker microswitches
DURATION : 0.20 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To achieve correct microswitch operation when either stacker has filled to a preditermined level and give HOPPER STACKER indication.
  Ensure that no physical deformation occurs to the msw command lever.
  Both stacker microswitches must trip with a margin of 8 ± 1 mm before the backup plates reach the end of their travel.
  Furthermore, a distance of 1 mm must exist between the command lever roller end of travel position and the roller bearing point.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Remove the two backup plates from the stackers.

2 - Remove the stacker shoulder which cover the backup plates supporting guides. The msws are now accessible.

3 - Slacken the fixing screw for the msw actuating bracket.

4 - Position the backup plate sliding support 8 ± 1 mm from the end of travel position. Holding the support, position, the microswitch actuating bracket to cause the msw just to trip.

5 - Tighten the actuating bracket fix screws.

6 - Check that with the msw actuating lever off the bracket, a distance of 1 mm must be measured between the roller and the work surface. If this requirement is not met, touch the position of the microswitch.

7 - Replace the stacker shoulder previously removed.

8 - Replace the backup plates on their guides and carry out Routine 4.16.

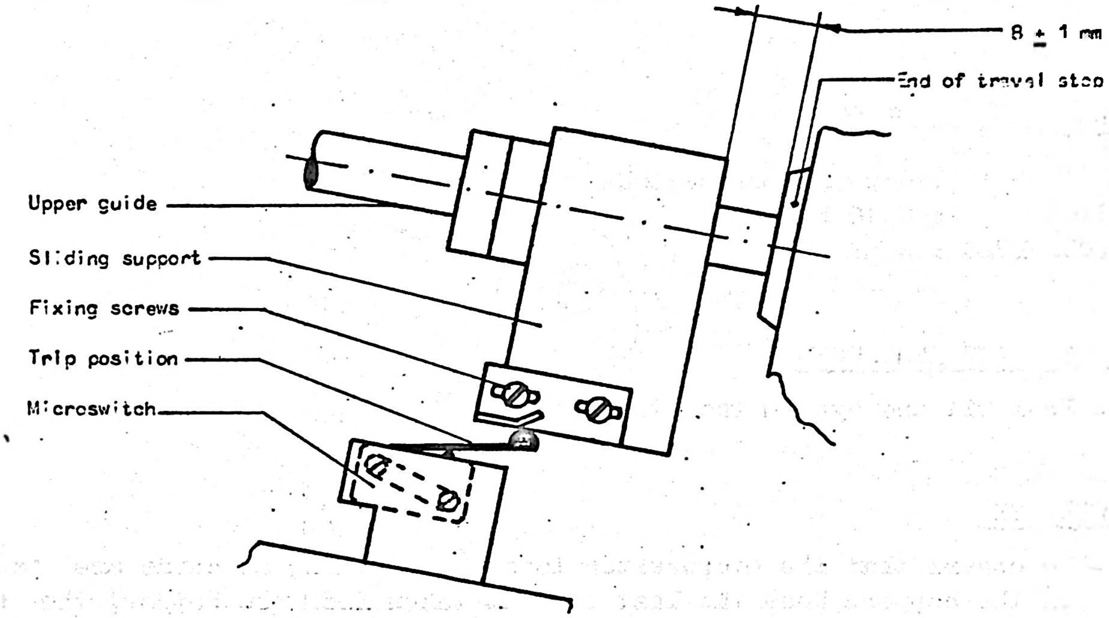

Fig. 4.28. - Stacker msw - trip position

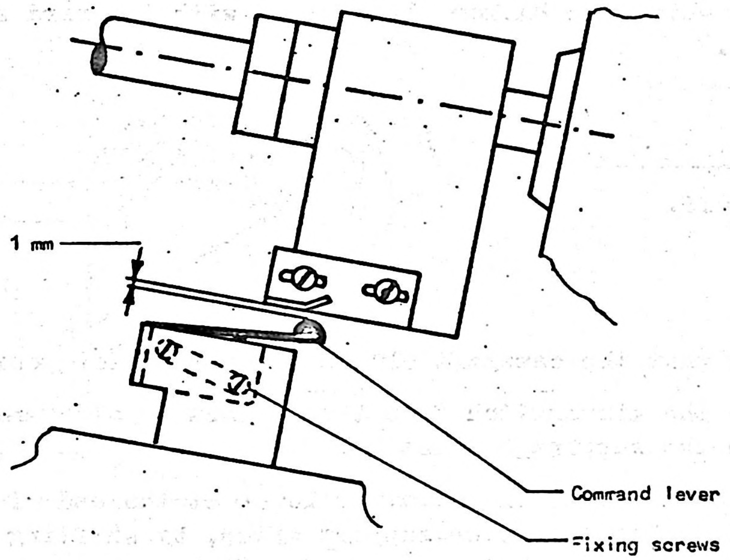

Fig. 4.29. - Stacker msw - tripped position

5 - FINAL CHECKS

- None.

ROUTINE : **4.23**

NAME : Hopper microswitch
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To ensure that the microswitch is closed as long as cards are present in the hopper. When the last card is taken from the hopper, the microswitch must trip to give the HOPPER STACKER indication.
  The reader must be at the stop with both clutches made. The msw must trip with a safety margin of 1.5 to 2 mm
  This tolerance is to measured with one card in the hopper checking the the travel of the backup plate from the moment the msw trips to the point at which the backup plate stops with the card adhering to the feed belts.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Ensure that the camshaft clutch is at the stop position.

2 - Remove the microswitch from its support by slackening screws T that secure the support bracket.

3 - Keep the microswitch actuating lever at the end of travel (withdrawn) position. Set the lever-support group, by shifting it in its screw slots, to obtain the roller to be withdrawn beyond the swinging platten plane by 0.3 to 0.6 mm

4 - Tighten the lever-support screws.

5 - Fit the microswitch, and keeping its actuating lever depressed, the msw plunger must be 0.3 to 0.6 mm from the center lug.

6 - When the correct clearance has been achieved tighten the msw securing screws.

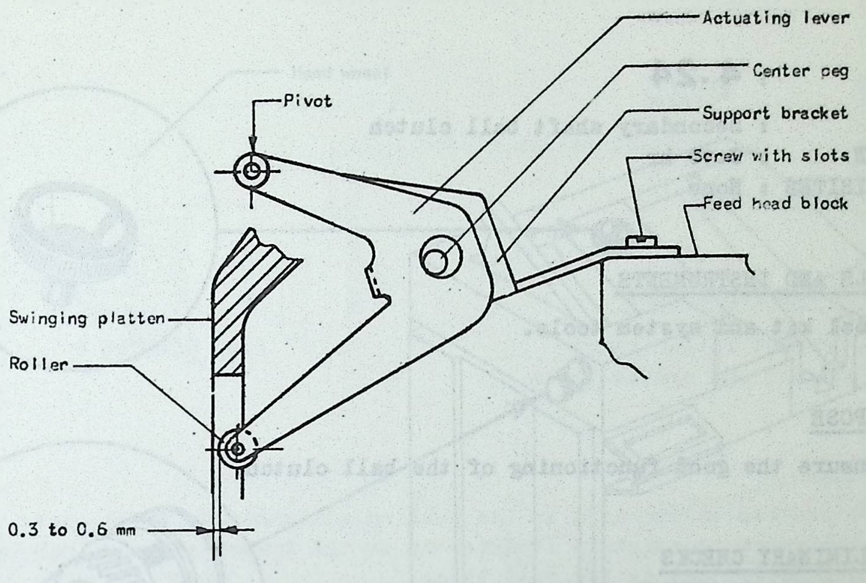

Fig. 4.30. - Hopper msw - levers withdrawn

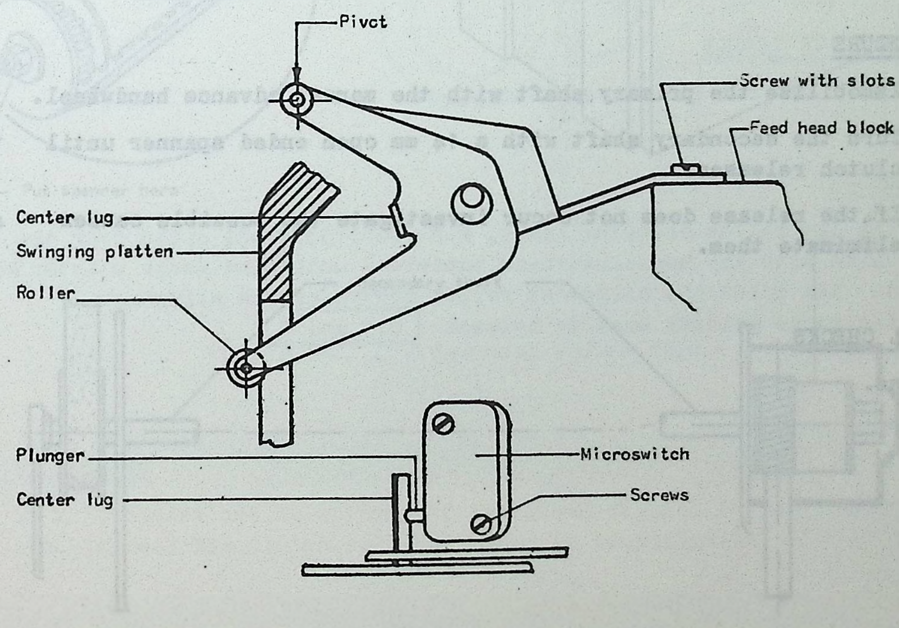

Fig. 4.31. - Hopper msw - lever protruding

5 - FINAL CHECKS

- Check out the adjustment.

ROUTINE : **4.23**

NAME : Hopper microswitch
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To ensure that the microswitch is closed as long as cards are present in the hopper. When the last card is taken from the hopper, the microswitch must trip to give the HOPPER STACKER indication.
  The reader must be at the stop with both clutches made. The msw must trip with a safety margin of **1.5 to 2 mm**
  This tolerance is to measured with one card in the hopper checking the the travel of the backup plate from the moment the msw trips to the point at which the backup plate stops with the card adhering to the feed belts.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Ensure that the camshaft clutch is at the stop position.

2 - Remove the microswitch from its support by slackening screws T that secure the support bracket.

3 - Keep the microswitch actuating lever at the end of travel (withdrawn) position. Set the lever-support group, by shifting it in its screw slots, to obtain the roller to be withdrawn beyond the swinging platten plane by **0.3 to 0.6 mm**

4 - Tighten the lever-support screws.

5 - Fit the microswitch, and keeping its actuating lever depressed, the msw plunger must be **0.3 to 0.6 mm** from the center lug.

6 - When the correct clearance has been achieved tighten the msw securing screws.

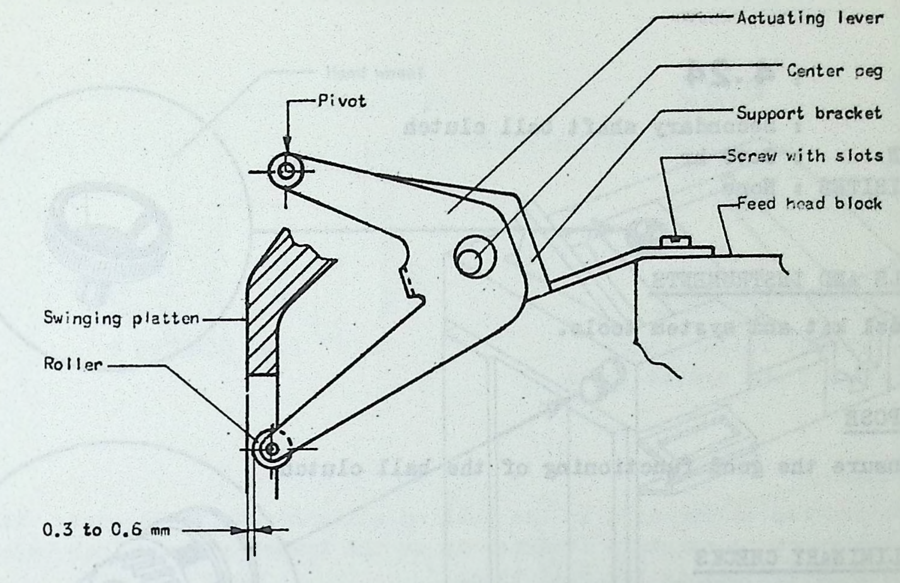

Fig. 4.30. - Hopper msw - levers withdrawn

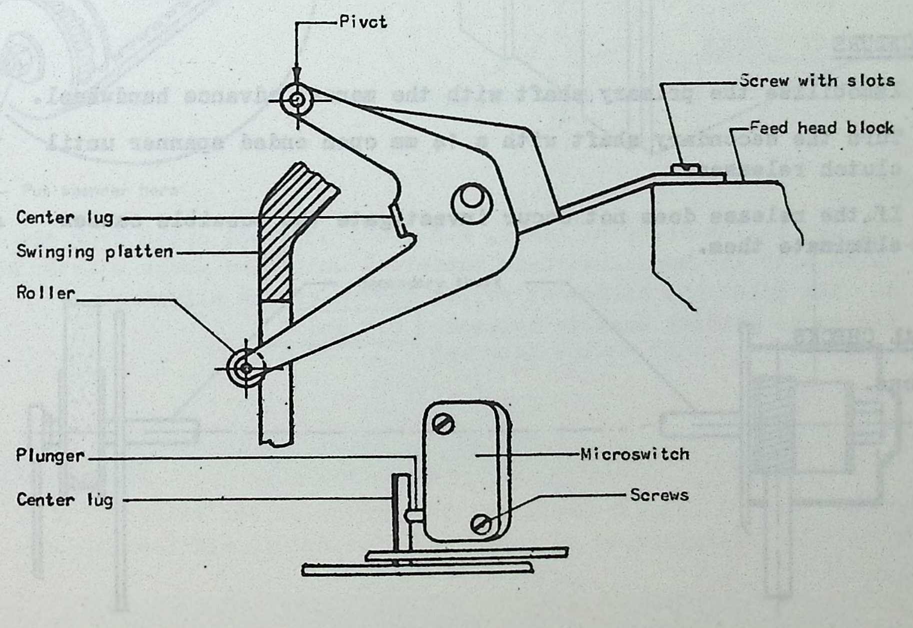

Fig. 4.31. - Hopper msw - lever protruding

5 - FINAL CHECKS

- Check out the adjustment.

ROUTINE : **4.24**

NAME : Secondary shaft ball clutch
DURATION : 0.10 hr
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 – PURPOSE

- Ensure the good functioning of the ball clutch.

3 – PRELIMINARY CHECKS

- Machine off.

4 – PROCEDURE

1 – Immobilize the primary shaft with the manual advance handwheel.

2 – Turn the secondary shaft with a 14 mm open ended spanner until the clutch releases.

3 – If the release does not occur investigate the possible causes and eliminate them.

5 – FINAL CHECKS

- None.

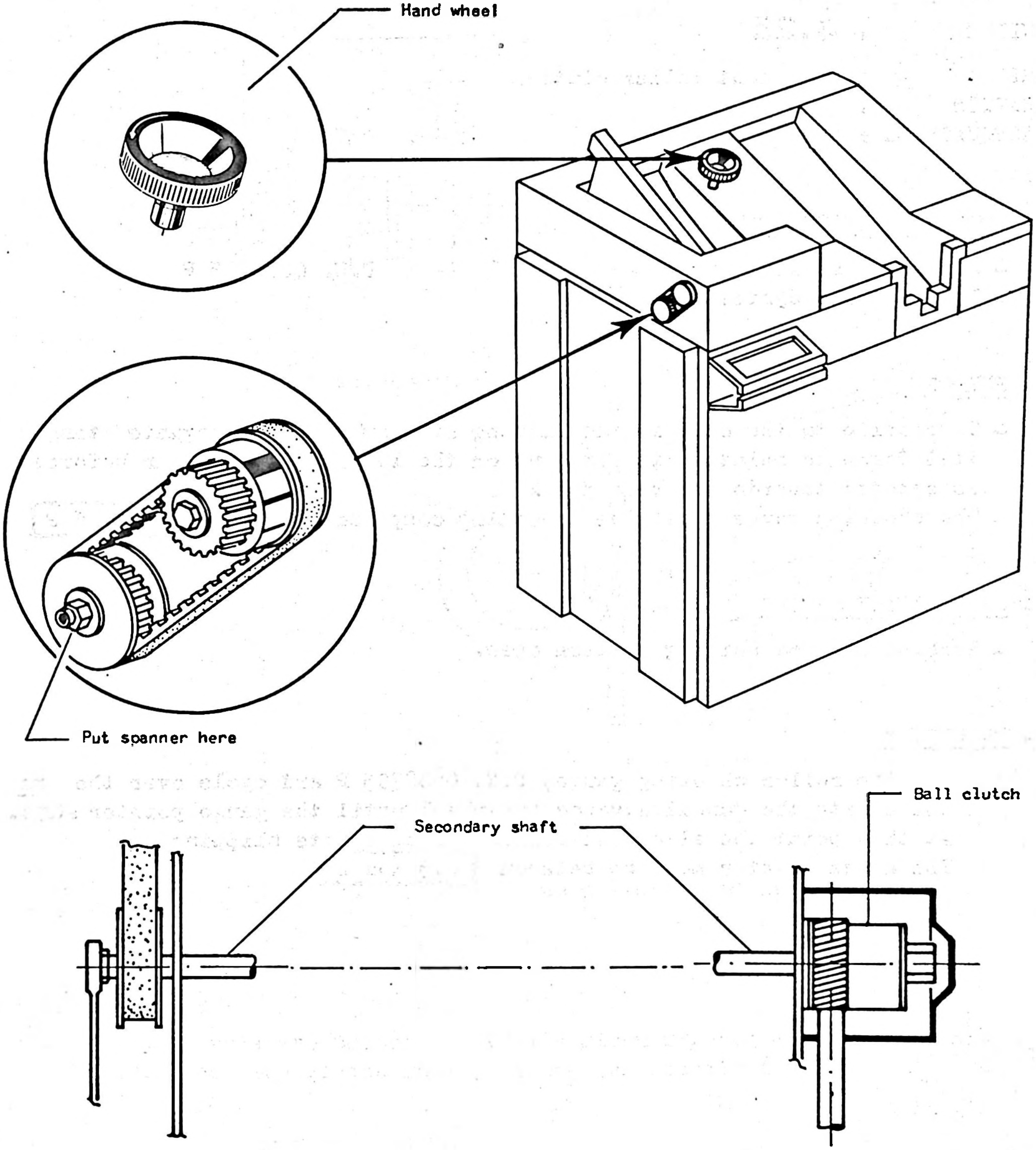

Fig. 4.32. – 4.33. – 4.34. – Ball clutch driving secondary shaft

ROUTINE : **4.25**

NAME : Alignment roller clutch
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Alignment roller gauge	P.N. 0688795 P
- Tool kit and system tools	

2 - PURPOSE

- To provide to the card in the waiting station with an adeguate tangential force to maintain it lined up on the lower reference bar before it is ejected towards the read track.
  The checking gauge must give a reading comprised between $\boxed{0.5 \text{ and } 2}$

3 - PRELIMINARY CHECKS

- Machine off and waiting station open.

4 - PROCEDURE

1 - Fit the roller checking gauge, P.N. 0688795 P and cycle over the machine with the manual advance handwheel until the gauge pointer stops. At this point the alignment roller clutch starts slipping.
The gauge pointer must be between $\boxed{0.5 \text{ and } 2}$

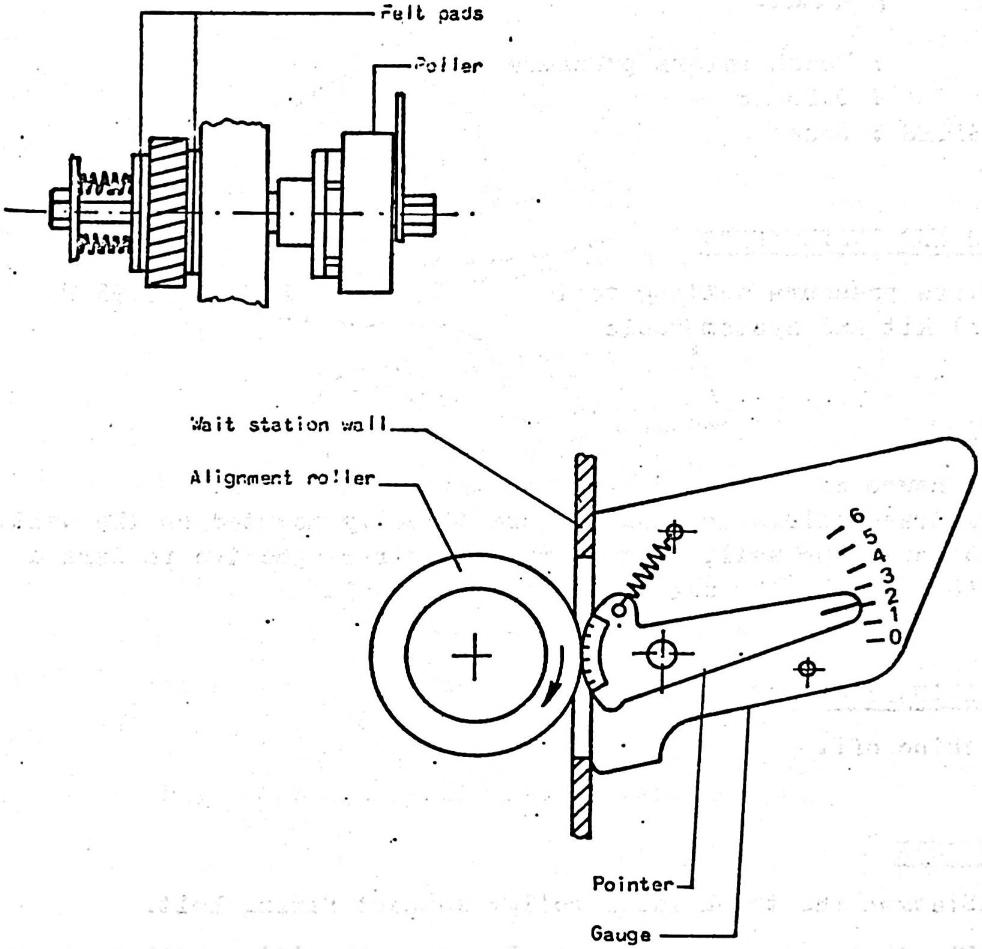

Fig. 4.35. - Alignment roller clutch

5 - FINAL CHECKS

- No adjustments are tolerated. If the given figured do not respect actual values, the clutch felt pads must be substituted.

ROUTINE : **4.26**

NAME : Track idlers pressure
DURATION : 0.20 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Idlers pressure setting tool	P.N. 0688796 T
- Tool kit and system tools	

2 - PURPOSE

- To ensure correct card transport along the track.
  All track idlers, excluded those directly mounted on the waiting station swinging wall, must exert on their respective rollers a pressure determined by the use of the special tool.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Slacken the track idler roller support fixing bolt.

2 - Fit the pressure setting tool across the idler roller support so to preload the loading spring.

3 - Push the idler up against its roller and tighten the bolt. Ensure that the support does not move during the tightening.

4 - Remove the tool thereby allowing the spring to bear on the idler.

5 - FINAL CHECKS

- None.

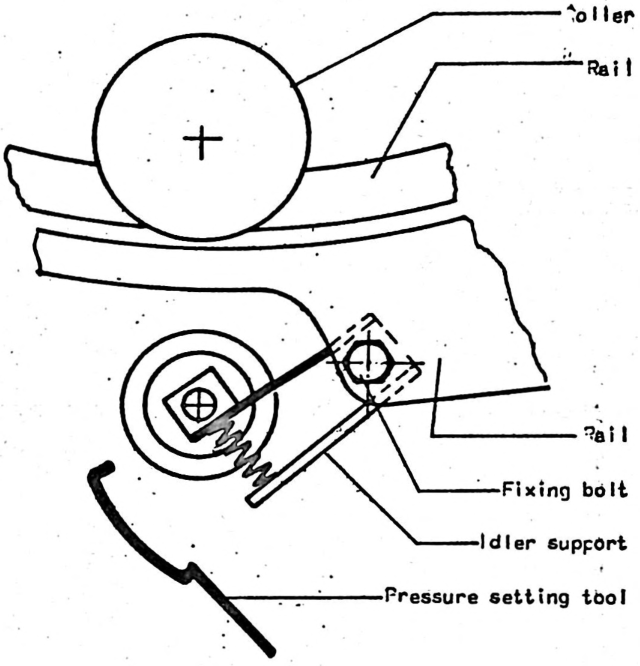

Fig. 4.36. - Rail idler - released

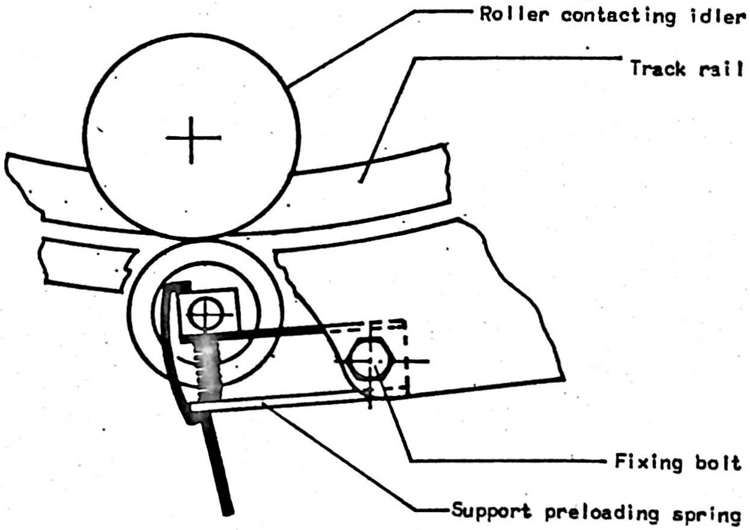

Fig. 4.37. - Rail idler - neared

ROUTINE : **4.27**
NAME : Read lamp
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- None.

2 - PURPOSE

- To obtain the maximum luminosity from the optic system.
  The read lamp must be so positioned to offer the opposite side of the quartz fusion bead to the read optics.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Fit the lamp to its support without fingering the quartz or the bulb. Engage first the lower contact, then the upper by pressing it down.

2 - Rotate the lamp so to have the fusion bead facing away from the read head.

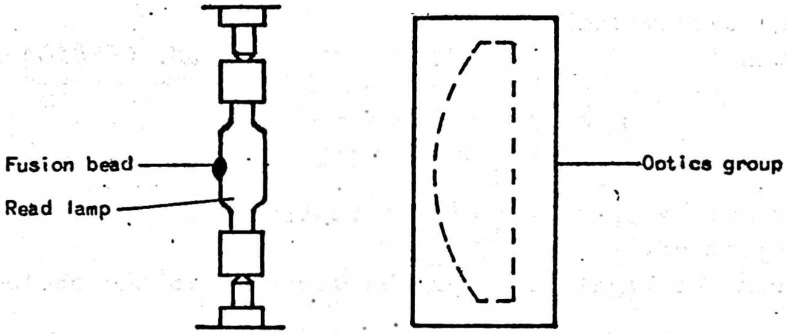

Fig. 4.38. - Read lamp

5 - FINAL CHECKS

- None.

ROUTINE **4.28**

NAME : Track, stacker and sync control photodiodes
DURATION : 0.15 hr
PREREQUISITES : Routine 4.31

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools	
- Reference pin	P.N. 0688104 A

2 - PURPOSE

- To obtain positive operation of the amplifier circuit of which the photodiode is part of.
  The beam from the light pipe must be centered to the photodiode.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Fit the reference pin in the light pipe support.

2 - Slacken the Z screws that secure the support.

3 - Position the support to have the pin tip centered on the orifice in the photodiode block.

4 - Tighten Z screws. See fig. 4.39.

5 - Remove the reference pin and insert the light pipe to have the pipe end in contact with the base of the support hole.

6 - Check that, with machine ON, the beam from the light pipe is centered on the photodiode.

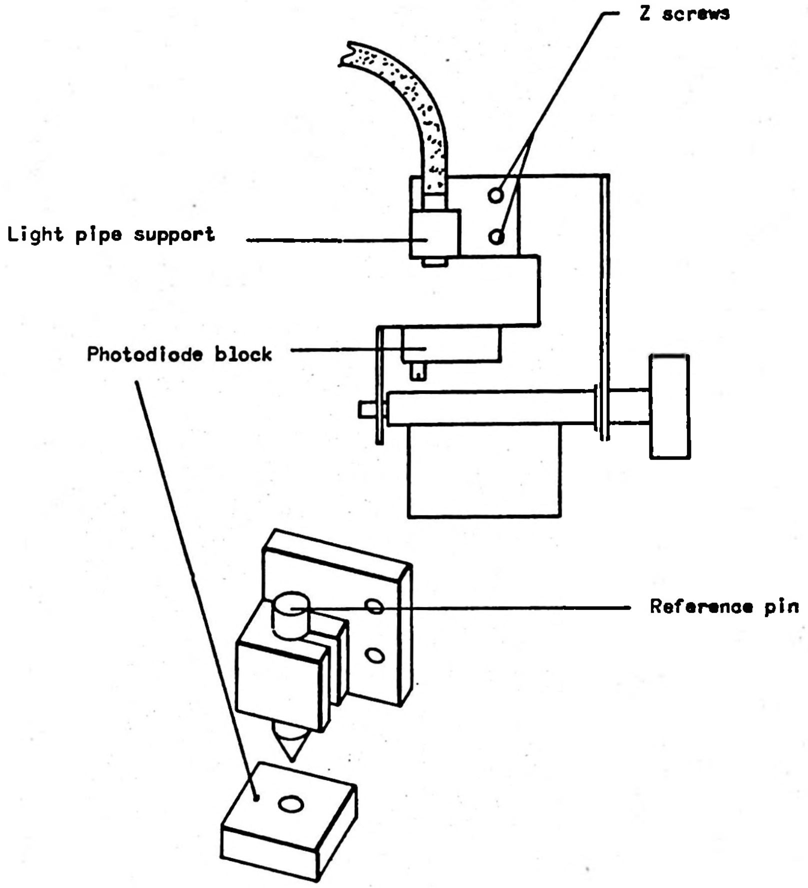

Fig. 4.39. – Track and stacker photodiodes and light pipe

5 – FINAL CHECKS

- None.

ROUTINE : **4.29**

NAME : Read photodiodes support
DURATION : 0.10 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Metal card	P.N. 0688799 Q
- Tool kit and system tool	

2 - PURPOSE

- To obtain positive read of all possible card perforation. The read photodiodes head must be perfectly positioned to present the slotted plate absolutely parallel to the axis of any card column.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Remove the read photodiodes head to uncover the slotted plate.

2 - Slacken the 4 frame fixing screws.

3 - Feed in the read station the metallized card, P.N. 0688799 Q. Cause the leading edge of the card to partially obscure the slot.

4 - Switch the machine on. With the read head support frame in the lowest position, slide the card slowly forward. Tighten the 4 fixing screws when darkness is obtained uniformly along the whole slot.

5 - Remove the metal card.

6 - Fit the head, taking up any positional play at the bottom right before securing it.

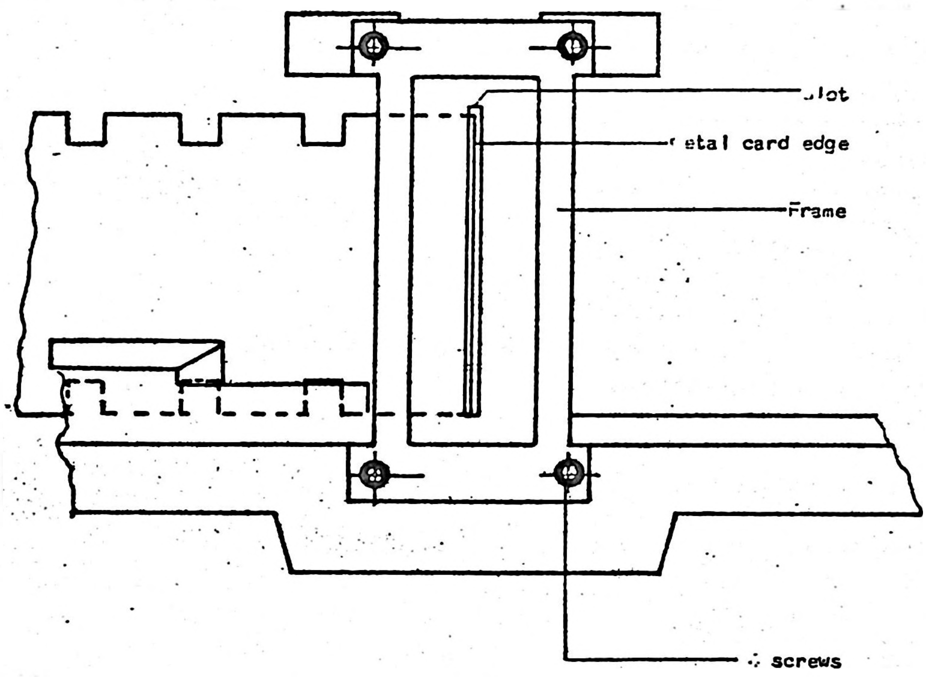

Fig. 4.40. - Read photodiodes support

5 - FINAL CHECKS

- Check for possible shift in the position of read signal Routine 4.36.

ROUTINE : **4.30**

NAME : Read lamp power supply
DURATION : 0.10 hr
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

- Voltmeter
- Tool kit and system tools.

2 – PURPOSE

- To permit the lamp to operate with optimum voltage requirement thus ensuring maximum duration.

3 – PRELIMINARY CHECKS

- Machine off.

4 – PROCEDURE

1 – ~~Check that the input voltage, at terminal board P1, points 1 and 2, is +20 VDC (Applicable only to CRD 160).~~

2 – Check that the input voltage at terminal board P2, points 2 and 4, is 220 VAC, 50 Hz or 208 VAC, 60 Hz ± 10% (Applicable only to LS 400 and LS 600).

3 – Slacken the lock nut on pot ~~RV5~~ for ~~CRD 160~~ or RV2 for LS 400 and LS 600.

4 – Set the voltmeter in DC, go across the lamp terminals and turn the interested pot to obtain 13.2 ± 1% VDC .

NOTE

To ease measurements, the reading may be taken on:
- Terminal board P1, points 3 and 4, ATA 230, for CRD 160.
- Terminal board, points 1 and 2, ALI 220, for LS 400 – 600.

If this method is used, the readings must be increased by 0.3 V to off set wire losses.
Reading must thus be 13.5 ± 1%

5 – FINAL CHECKS

- None.

ROUTINE : **4.31**

NAME : Light pipe support position
DURATION : 0.20 hr
PREREQUISITES : Routine 4.27

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools
- N° 2 reference pins P.N. 0688104 A

2 - PURPOSE

- To obtain correct operation of the photocontrol circuits, driven by the 5 light pipes.
- The read lamp filament must be in the point where the 5 light pipes axis intersect.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Fit the two reference pins as shown in fig. 4.40 a.
Tighten the fixing screws to have a clearance from 3 to 5 mm between the tip and the bulb.

2 - Loosen Z screws.

3 - Viewing the assembly from the top, position the support in order to have the pin axis intersecting the lamp filament.

4 - Tighten Z screws.

5 - Remove the two pins and insert the five pipe heads on the support , tightening the fixing screws.

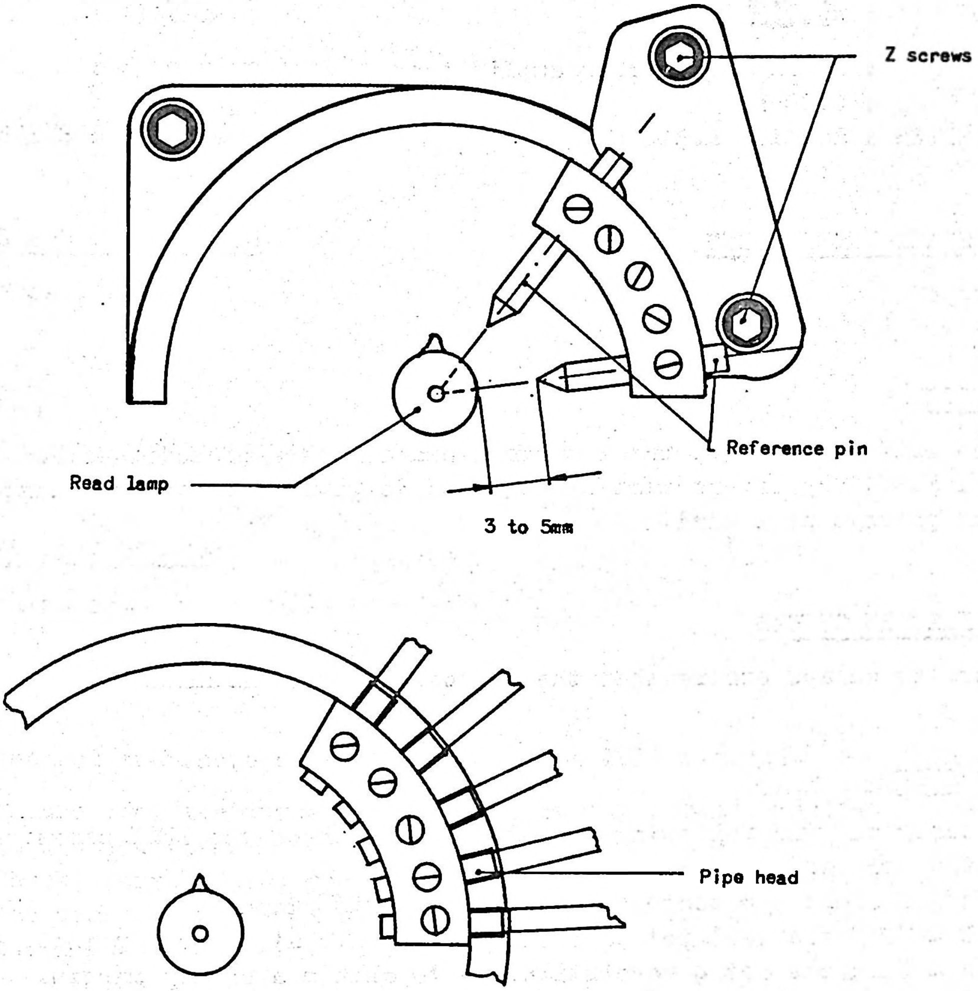

Fig. 4.40a . – Light pipe support centering

5 – FINAL CHECKS

– None.

ROUTINE : **4.32**

NAME : Track photodiodes amplifiers
DURATION : 0.20 hr
PREREQUISITES : Routine 4.31.

1 - TOOLS AND INSTRUMENTS

- Scope

2 - PURPOSE

- The waiting station, track control and stackers photodiodes(FOCA, FOTA and FOBU) amplifiers must be adjusted to give positive switching at the passage of a card.

3 - PRELIMINARY CHECKS

- Machine on and ensure that the photodiodes are illuminated.

4 - PROCEDURE

1 - Carry out the following operations to each of the AFOT circuits relative to said photodiodes:
  a - Connect the scope on the AFOT circuit output.
  b - Vary the AFOT pot to bring the circuit at cut-off point.
  c - Turn the pot 4 revolutions CW to obtain a safety margin.

5 - FINAL CHECKS

- None.

FOTA	- KARTEN BAHN	A07-16	ATA 211
FOCA	- WAITING STATION	A07-01	—"—
FOBU	- NORMAL Fach	→ A06-01	—"—
POBU	- EJECTIONS Fach		

ROUTINE : **4.33**

NAME : Sync signal FODI
DURATION : 0.10 hr
PREREQUISITES : Routine 4.31.

1 – TOOLS AND INSTRUMENTS

- Scope.

2 – PURPOSE

- To ensure efficiency of the sync signal FOSI.

3 – PRELIMINARY CHECKS

- Machine on.

4 – PROCEDURE

1 – Connect the scope on the output of the FODI circuit.

2 – Ensure that the duration of signal FOSI is about 31.5 µs and that it has a waveform factor of 1 to 1 for +ve to –ve.
Check, furthermore, that the spread between two successive periods is the same or under 2 µsecs and the same or under 15 µsecs between 60 successive periods.

5 – FINAL CHECKS

- If the results to the checks described at step 2 of the adjustment procedure do not give satisfaction, establish the fault before proceding to further checks.

ROUTINE : **4.34**

NAME : Read head photodiode amplifiers adjustment
DURATION : 0.50 hr
PREREQUISITES : Routine 4.30.

1 – TOOLS AND INSTRUMENTS

- Scope.

2 – PURPOSE

- To obtain the maximum functional safety margin.
  The read signal corresponding to a perforation, must have a duration of $\boxed{350\ \mu\text{secs}}$.

3 – PRELIMINARY CHECKS

- Machine on.

4 – PROCEDURE

1 – Load a card deck having some perforations on all rows. Check the cards with a punch jig. chapter 859

2 – Set the machine in OFF LINE (switch AUTO) and feed cards in continuous mode.

3 – Vary the pot of each AFOT circuit, setting each signal for a duration of $\boxed{350\ \mu\text{secs}}$ scoping all the signals. See fig. 4.41. .

> **Note**
>
> If feeding in continuous mode should result difficult, instead of setting the AUTO switch, insert a jumper between the ATA 211 A37-13 (MONO) and A24-15 (AUTO) pins.
> The jumper may easily be removed to interrupt the card feed.

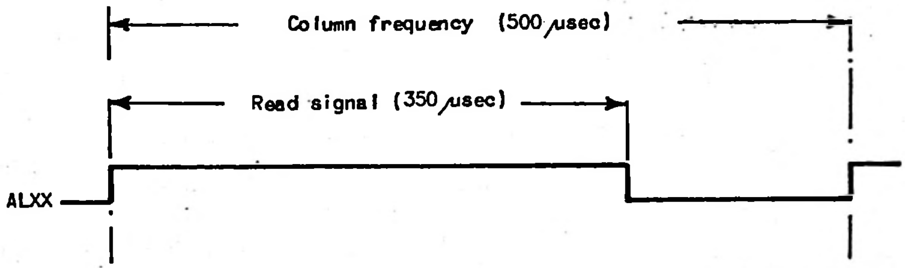

Fig. 4.41. - Read signal

5 - FINAL CHECKS

- None.

ROUTINE : **4.35**

NAME : Machine one-shots
DURATION : 2 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Scope	
- Bridging link	P.N. 0800761 V

2 - PURPOSE

- To place machine circuits in their optimum working conditions.
All card reader one shots must respect the values given in the one-shot timing lists.

3 - PRELIMINARY CHECKS

- Machine on.

4 - PROCEDURE

4.1. - UNIV

1 - Set the machine in OFF LINE and feed cards casually perforated.

2 - Check with the scope that the duration of all one-shots respects the values indicated in the one-shot timing lists.

3 - Trim the pots of those one-shots that require adjustment.

4.2. - UNRA and ULUN

1 - Sync the scope on "INT" negative.

2 - Periodically short to ground the input of the interested UNRA to simulate the triggering of the one-shot.

3 - Check with the scope that the duration of the positive going output signak respects the values shown in the one-shot timing lists.

4 - Vary the value of the time capacitor, if necessary.

5 - Place the machine back ON LINE.

5 - FINAL CHECKS

- None.

ROUTINE : 4.36

NAME : Read head skew
DURATION : 0.15 hr
PREREQUISITES : Routine 4.34.

1 - TOOLS AND INSTRUMENTS

- Scope.

2 - PURPOSE

- To obtain the maximum read accuracy of all possible perforations on a cards.
  All the perforations in one column must present themselves to the read station in the same interval of time or within a max spread of 50/usec.

3 - PRELIMINARY CHECKS

- Machine on.

4 - PROCEDURE

1 - Place the reader on OFF LINE and feed un-punched cards which have been jig checked for dimensions.

2 - Sync the scope on the negative edge of signal AL09 of row 9 (instant when card enters read station).
Check max spread of the negative edge of the row 11, AL11 read signal.

3 - Repeat operation at point 2 swapping the input with the sync.

4 - Check that the spread between the two signals is not greater than ± 50 µs

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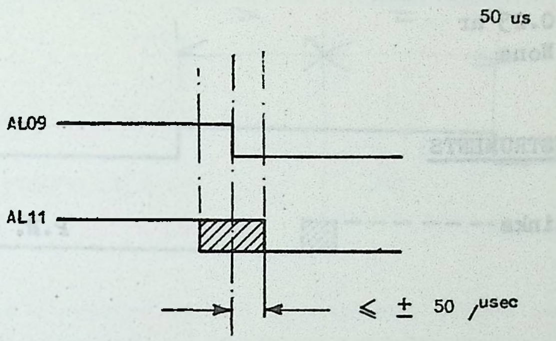


Fig. 4.42. - Read signal admitted spread

5 - FINAL CHECKS

- If the checks carried out driving the procedure do not give satisfactory results, the cause of the malfunction is to be found.

ROUTINE : **4.36**

NAME : Read head skew
DURATION : 0.15 hr
PREREQUISITES : Routine 4.34.

1 – TOOLS AND INSTRUMENTS

- Scope.

2 – PURPOSE

- To obtain the maximum read accuracy of all possible perforations on a cards.
  All the perforations in one column must present themselves to the read station in the same interval of time or within a max spread of 50/usec.

3 – PRELIMINARY CHECKS

- Machine on.

4 – PROCEDURE

1 – Place the reader on OFF LINE and feed un-punched cards which have been jig checked for dimensions.

2 – Sync the scope on the negative edge of signal AL09 of row 9 (instant when card enters read station).
Check max spread of the negative edge of the row 11, AL11 read signal.

3 – Repeat operation at point 2 swapping the input with the sync.

4 – Check that the spread between the two signals is not greater than $\boxed{\pm 50\ \mu s}$

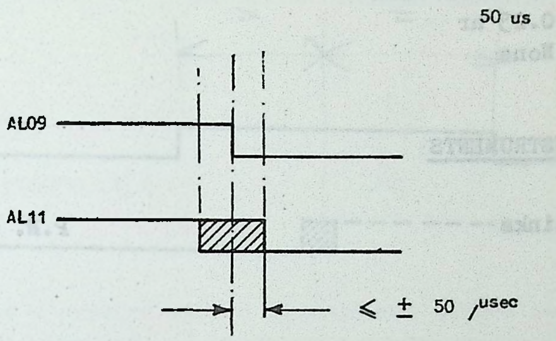


Fig. 4.42. – Read signal admitted spread

5 – FINAL CHECKS

- If the checks carried out driving the procedure do not give satisfactory results, the cause of the malfunction is to be found.

ROUTINE : **4.37**

NAME : One-shot RIPE
DURATION : 0.25 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Scope.
- Bridging links P.N. 0800761 V

2 - PURPOSE

- To obtain sync between perforation read and the count that discern them.
  One-shot RIPE must have a recovery time such to cause the punch frequency counters IMOA to IMOD to be in phase with the card perforations read.

3 - PRELIMINARY CHECKS

- Machine off.

RIPE UNIV A23-1

4 - PROCEDURE

1 - Place the reader in OFF LINE. Feed through cards which have been jig checked and punched on rows 4 and 3 on alternate columns.

A25-11 A23-10

2 - Ground signals COME and COPI on the ATA 211.

A30-15

3 - Sync the scope on the negative edge of signal IMOD. Observe signal PEFO which is the OR of row 3 and 4 read signals.

C13-15

4 - Adjust one-shot RIPE to have signal PEFO coincide with the observed signal half way position.

5 - Remove links from COME and COPI and place the machine back ON LINE.

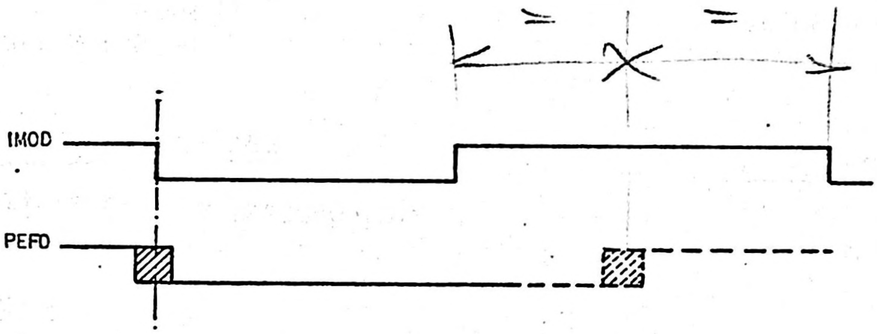


Fig. 4.43. - One-shot RIPE adjustment

5 - FINAL CHECKS

- None.

ROUTINE : **4.38**

NAME : COIN circuit
DURATION : 0.30 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Scope	P.N. 0800761 V
- Bridging links	

2 - PURPOSE

- To check the efficiency of all COIN circuits.

3 - PRELIMINARY CHECKS

- Machine on.

4 - PROCEDURE

1 - Place the reader in OFF LINE (switch AUTO).

2 - Set REJECT-STOP to REJECT and feed through some unpunched cards.

3 - Bridge pins 6 and 4, 10 and 12, 14 and 16 of each COIN board.
Check that at every bridging operation, the READ ALERT (or READ CHECK) lamps, on the operator's console, light.
The EROF lamp on the maintenance console will also light in case of an LS 600 subsystem.

5 - FINAL CHECKS

- If the conditions mentioned above are not satisfied, find and rectify the fault.

ROUTINE : **4.39**
NAME : Read group margins
DURATION : 0.20 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Voltmeter.

2 - PURPOSE

- To prevent machine stoppages caused by spurious errors induced by restricted functional margins.

3 - PRELIMINARY CHECKS

- Machine on.

4 - PROCEDURE

1 - Set the machine in OFF LINE and feed through cards punched anyhow.

2 - Fix the read lamp voltage between 12.3 and 14.1 V adjusting pot RV2 on the ALI 220, for LS 600 and LS 400, and pot RV5 on the ATA 230 for the CRD 160.

3 - Check that the lamps of READ ALERT for CRD 160 or indicator EROF for LS 600 or LS 400 do not light within this field.

4 - Set the lamp voltage back to 13.2 V

5 - FINAL CHECKS

- If the above mentioned conditions are not satisfied and READ ALERT or and EROF light quite often, the fault is to be traced and rectified.

5. REMOVALS AND REPLACEMENTS

ROUTINE : **5.1**

NAME : Waiting station
DURATION : 1.50 hrs
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Engineer's tool kit.

2 - PURPOSE

- Allow the repair or the substitution of parts belonging to the waiting station.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Disconnect the connector from the waiting station left hand side and remove the light pipe.

2 - Unscrew the lock nut and nut on the left hinge. Remove the spring washer.

3 - Remove the head output counterrollers group.

4 - Remove the right hinge.

5 - Remove the waiting station hinged wall, drawing it leftwards. Keep it in the "half open" position to prevent it touching the lower side stop.

4.2. - REPLACEMENT

1 - Follow the removal sequence in the reverse order.

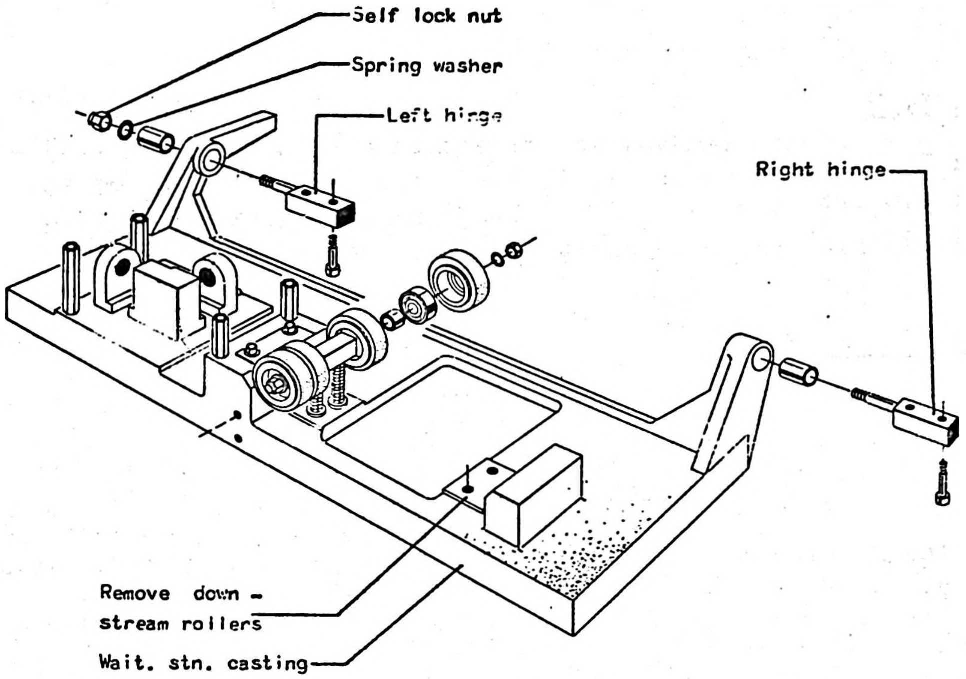


Fig. 5.1. – Waiting station

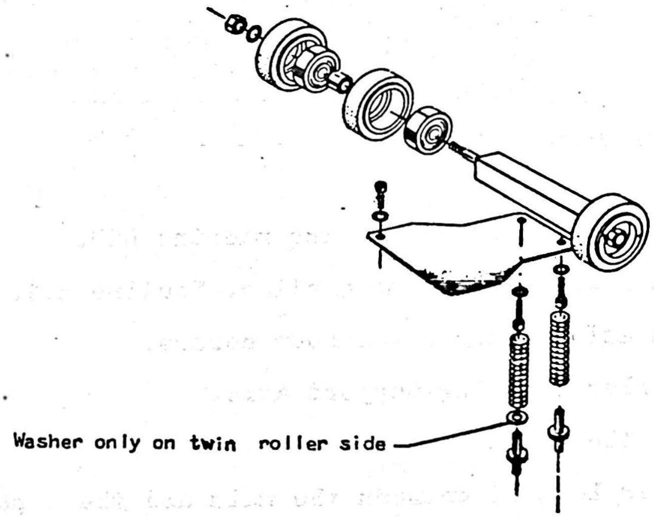


Fig. 5.2. – Head downstream rollers

NOTE

Tighten the lock nut until a slight friction is felt on the waiting station hinge. When replacing the counter roller group, fit the shim on the spring side of the double roller.

5 – FINAL CHECKS

- None.

ROUTINE : **5.2**

NAME : Feed block
DURATION : 2.0 hrs
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 – PURPOSE

- To allow the repair or the substitution of parts belonging to the card feed group.

3 – PRELIMINARY CHECKS

- Machine off.

4 – PROCEDURE

4.1. – REMOVAL

1 – Disconnect the 3 connectors located on the machine LHS.

2 – Remove the hinged wall of the waiting station. Routine 5.1.

3 – Remove the waiting station base plate. Four screws.

4 – Slacken the eject roller swinging support axis.

5 – Remove the belt from the eject roller pulley.

6 – Slacken the belt idler located between the main and the photodisc shafts.

7 – Undo the outer nut of the primary shaft. Immobilize the shaft with an 8 – 9 mm open ended spanner fitted on the flat at the top of the shaft.

8 – Remove the freed belts.

9 – Remove the 6 screws that secure the block, from the bottom, to the base.

10 – Remove from the top the feed block.

4.2. – REPLACEMENT

1 – Follow the removal sequence in the reverse order.
At point 7, ensure that the 6 Allen screws fit squarely in their seats before tightening them.
Fit the eject roller belt moving the block to take up any play.

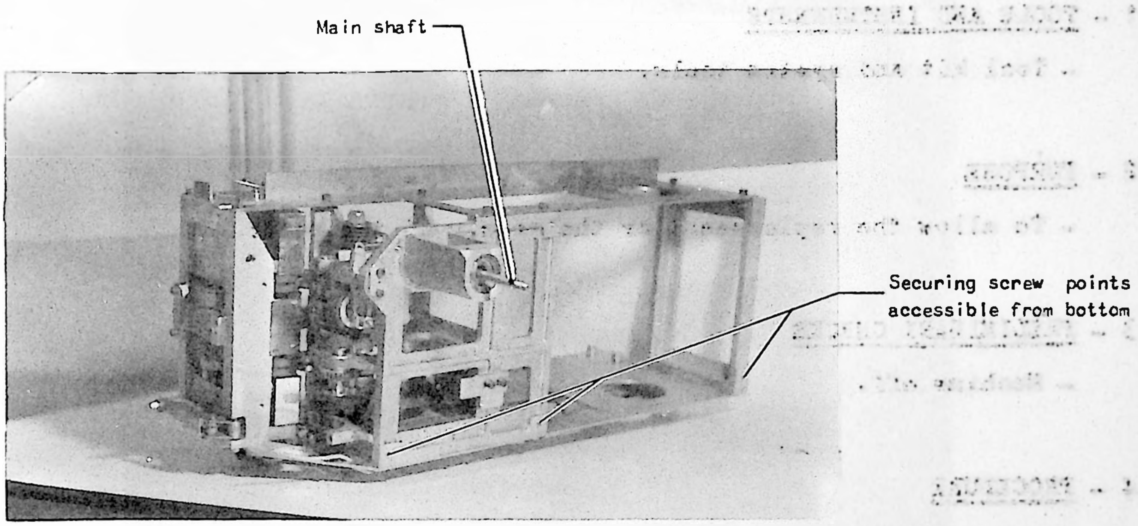


Fig. 5.3. – Feed block removed

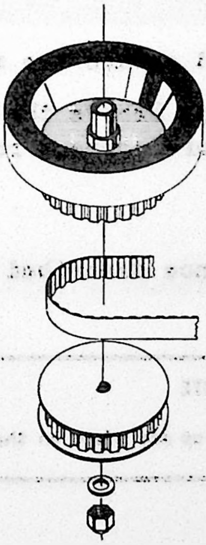


Fig. 5.4. – Primary shaft detail

5 – FINAL CHECKS

- Adjust belt idler. Routine 4.18.

ROUTINE : 5.3

NAME : Motor removal
DURATION : 2.0 hrs
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To allow the replacement or the repair of the motor.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Slide off the drive belt.

2 - Undo the 4 Allen screws that secure the motor and remove downwards.

3 - Fit a new motor if necessary. Remove the power supply cable marking the individual wires to ensure correct rotation.

4.2. - REPLACEMENT

- Carry out the removal sequence described at point 4.1.

NOTE

Before tightening the screws, take up any slack on the drive belt.

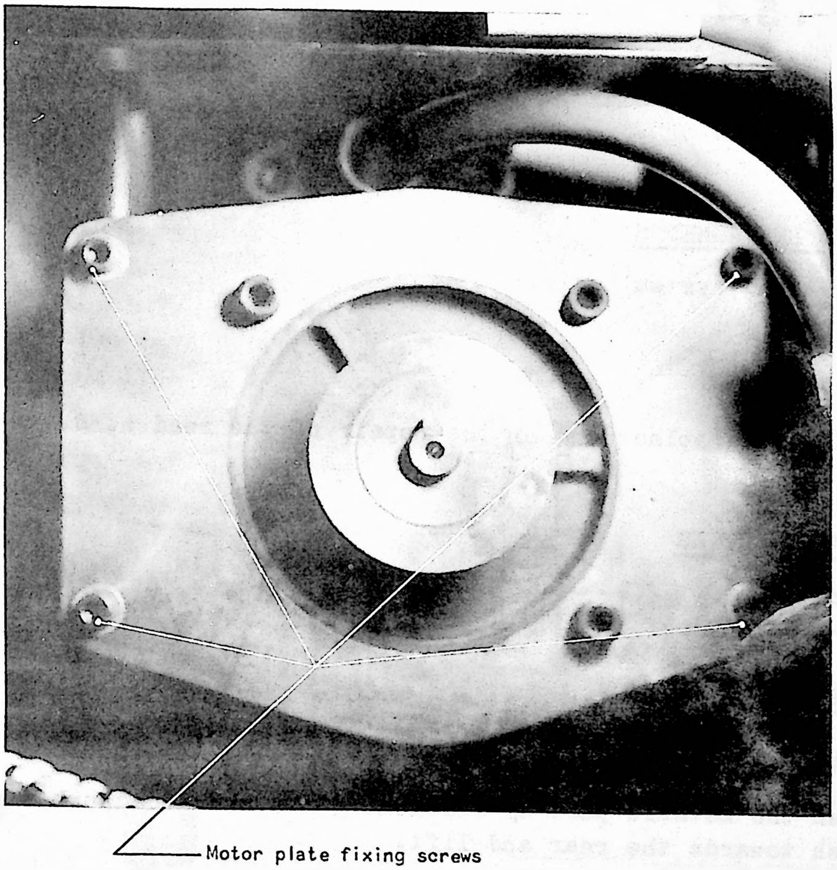


Fig. 5.5. – Motor support plate

5 – FINAL CHECKS

– None.

ROUTINE : 5.4

NAME : Read head
DURATION : 1.0 hr
PREREQUISITES : None

1 – TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 – PURPOSE

- To allow the replacement or the repair of the read head.

3 – PRELIMINARY CHECKS

- Machine off.

4 – PROCEDURE

4.1. – REMOVAL

1 – Open the movable part by slackening the knurled thumb screws. Push towards the rear and lift.

2 – Undo the 4 screws holding fixing the head support and remove the head group.

4.2. – REPLACEMENT

- Carry out operations described at point 4.1, in the reverse order.

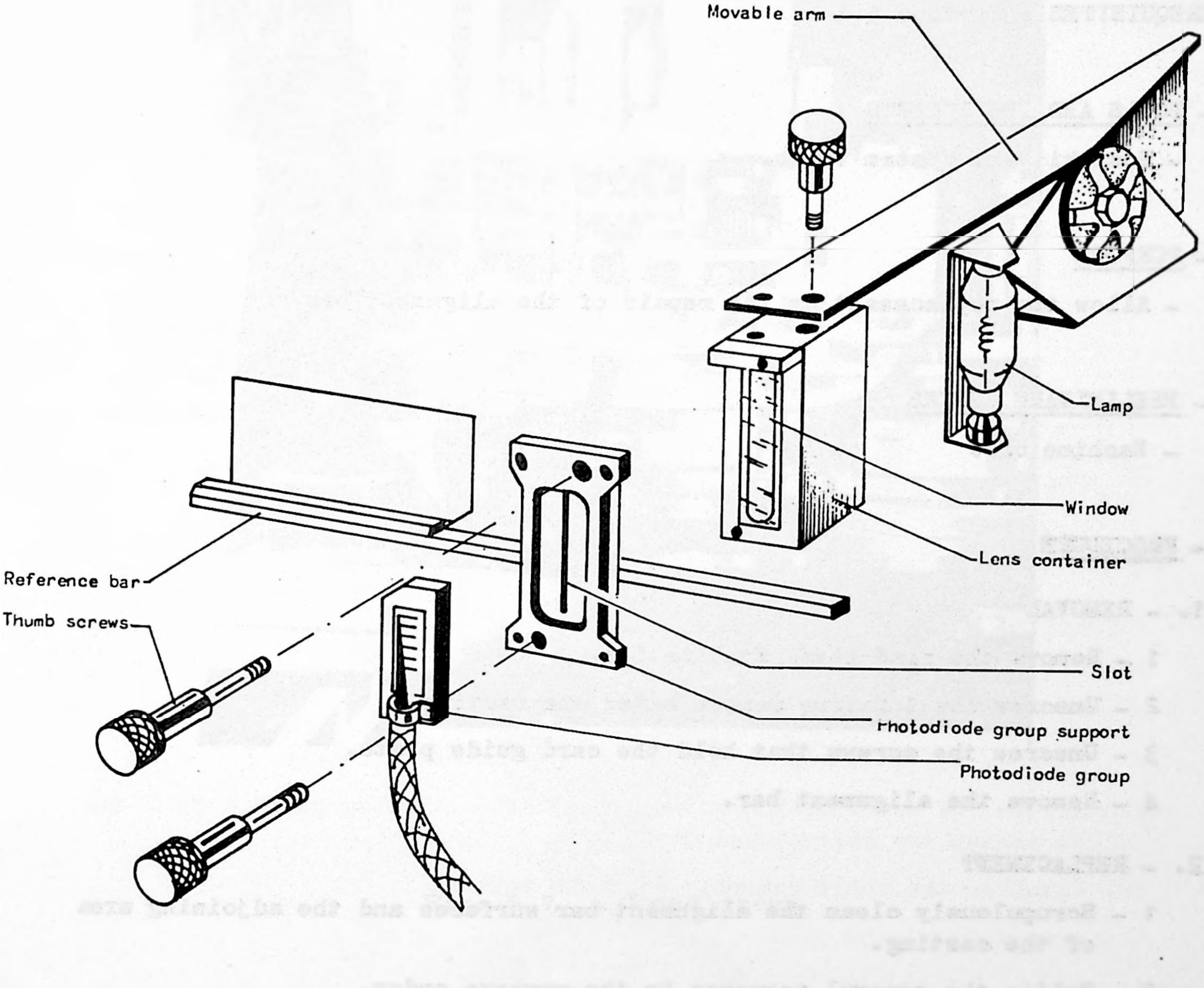


Fig. 5.6. – Read head

5 – FINAL CHECKS

- Check out the position of the photodiode support. Routines 4.29 and 4.36.

ROUTINE : 5.5

NAME : Alignment bar
DURATION : 1.5 hrs
PREREQUISITES : Routine 5.4.

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- Allow the replacement or the repair of the alignment bar.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the read head. Routine 5.4.

2 - Unscrew the 4 fixing screws under the casting.

3 - Unscrew the screws that hold the card guide plate.

4 - Remove the alignment bar.

4.2. - REPLACEMENT

1 - Scrupulously clean the alignment bar surfaces and the adjoining area of the casting.

2 - Follow the removal sequence in the reverse order.

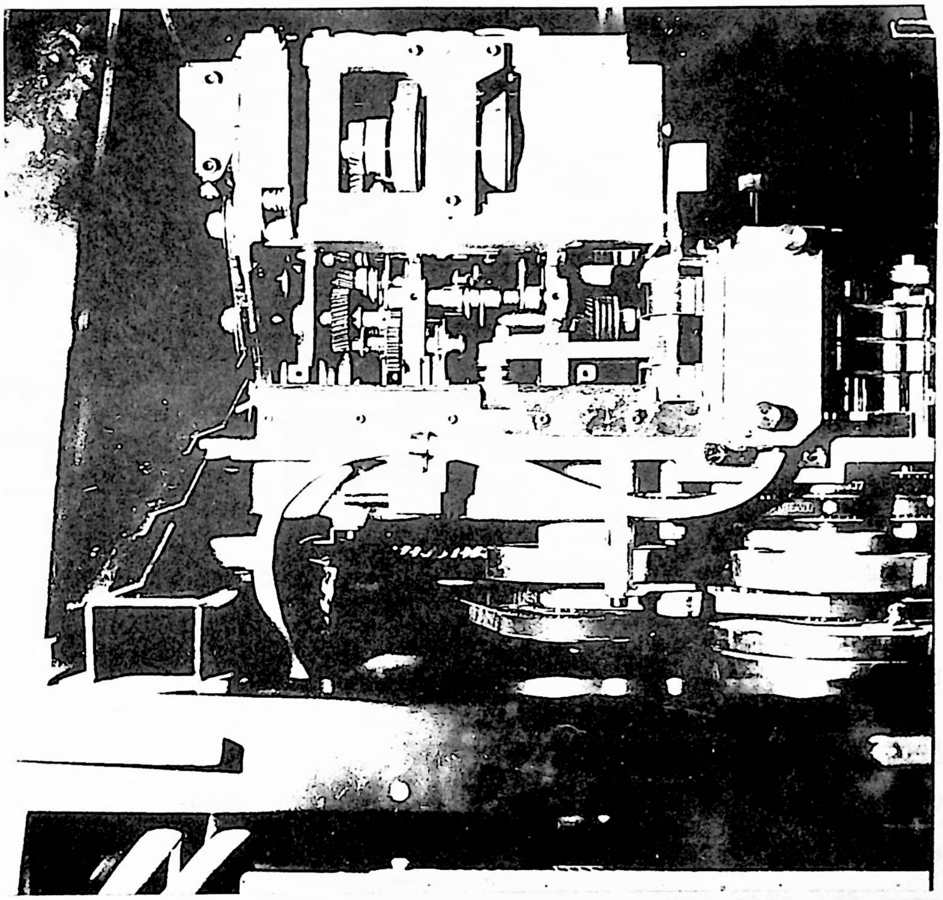


Fig. 5.7. - Feed group

5 - FINAL CHECKS

- Check out the position of the photodiode support. Routines 4.29 and 4.36.

ROUTINE : **5.6**

NAME : Photodisc group
DURATION : 1.0 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To allow the replacement or sepair of photodisc parts.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Disconnect the two connectors on the support base.

2 - Carefully unscrew the dust cover.

3 - Unscrew the stop arm on the hexagonal distance piece.

4 - Remove the self-locking nut on the shaft, exerting great care not to damage the photoetched disc.

5 - Withdraw the whole assembly from the bottom.

6 - Remove the light pipe.

4.2. - REPLACEMENT

1 - Scrupulously clean the photodisc with chammy leather.

2 - Follow the removal sequence described at point 4.1., in the reverse order.

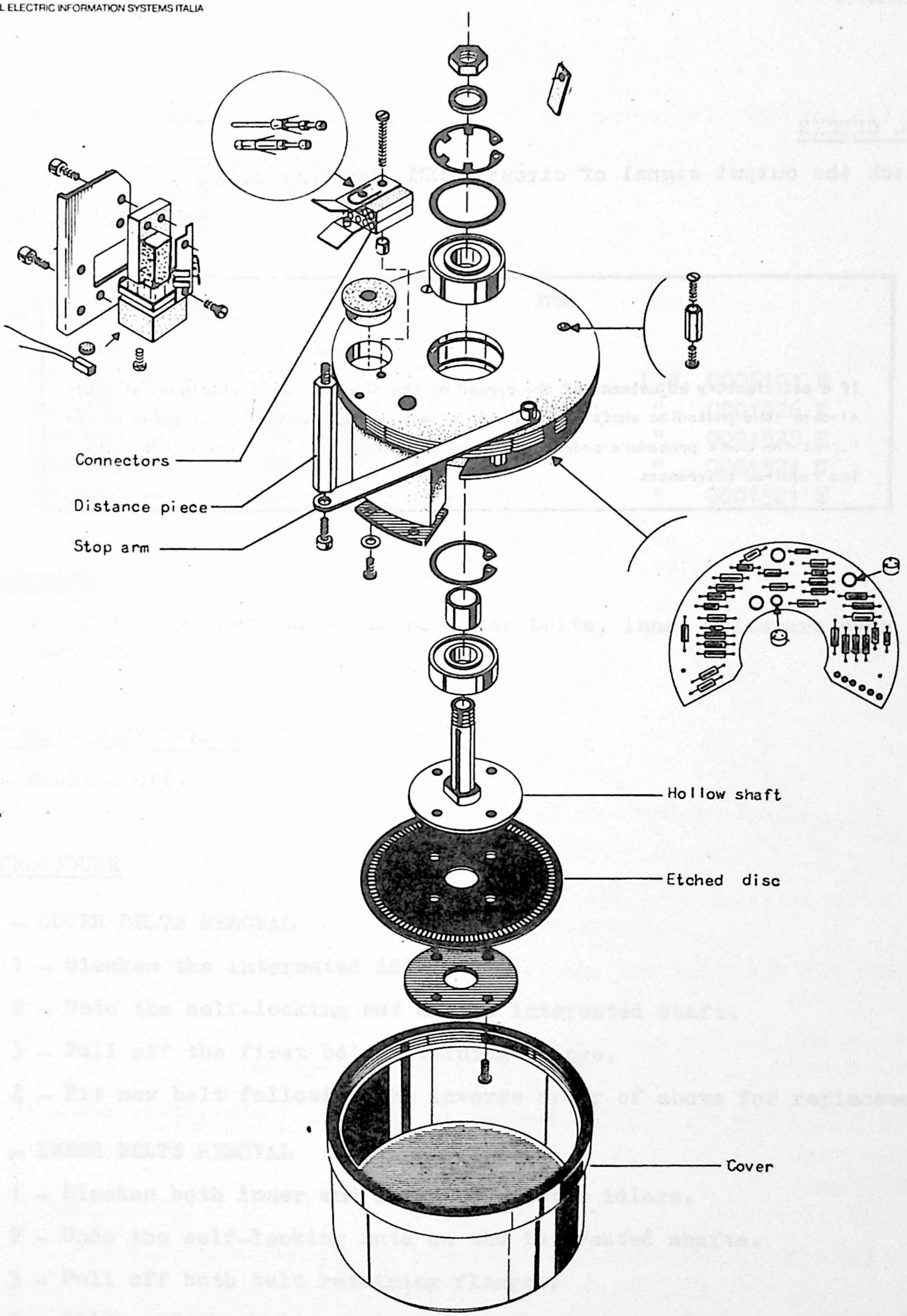


Fig. 5.8. – Photodisc group exploded view

9 - FINAL CHECKS

- Check the output signal of circuit FODI. Routine 4.33.

NOTE

If a satisfactory adjustment of the spread of the signal is not obtained, slightly slacken the photodisc shaft lock nut and slowly rotate the various distance pieces. Repeat the check procedure and/or the above adjustment to bring signal FODI within the required tolerances

ROUTINE : **5.7**

NAME : Track belts
DURATION : 0.5 hr
PREREQUISITES : None

1 - TOOLS AND MATERIALS

- Tool kit and system tools			
- Toothed belt	120XL	0.37	P.N. 0005101 H
- Toothed belt	200XL	0.37	" 0001526 K
- Toothed belt	170XL	0.37	" 0001525 F
- Toothed belt	130XL	0.37	" 0001524 B
- Toothed belt	100XL	0.37	" 0001521 E

2 - PURPOSE

- To replace either the inner or outer belts, inner belts are near the casting.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - OUTER BELTS REMOVAL

1 - Slacken the interested idler.

2 - Undo the self-locking nut on the interested shaft.

3 - Pull off the first belt retaining flange.

4 - Fit new belt following the inverse order of above for replacement.

4.2. - INNER BELTS REMOVAL

1 - Slacken both inner and outer interested idlers.

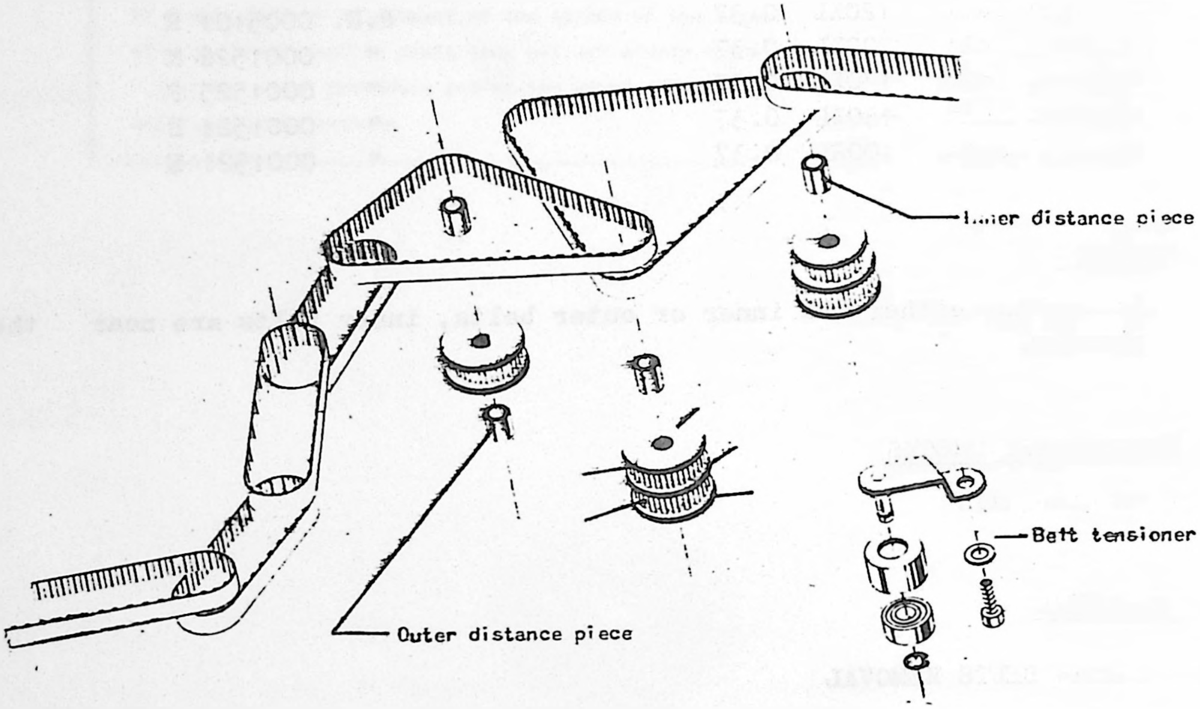
2 - Undo the self-locking nuts on the interested shafts.

3 - Pull off both belt retaining flanges.

4 - Slide off the belts that prevent the fitting of the required belt.

5 - Pull off the outer pulley and the intermediary flange from each shaft.

6 - Fit new belt following the inverse order of above, for replacement.



1 = Inner belts
2 = Outer belts
3 = Inner flange
4 = Inner pulley
5 = Outer pulley
6 = Middle flange
7 = Outer flange

Fig. 5.9. - Track belts

5 - FINAL CHECKS

- Adjust the belt tensioner. Routine 4.18.

ROUTINE : **5.8**

NAME : Eject roller belt
DURATION : 3 hrs
PREREQUISITES : Routine 5.1 and 5.5.

1 - TOOLS AND MATERIALS

- Tool kit and system tools
- Toothed belt 110XL 0.37 P.N. 0001522 J

2 - PURPOSE

- Replace the belt of the eject roller.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the swinging wall of the waiting station. Routine 5.1.

2 - Remove the waiting station bottom plate (4 screws).

3 - Remove the block on the right of the hopper to facilitate the removal of the primary shaft (2 Allen screws).

4 - Remove the read head (Routine 5.4.) and the alignment bar (Routine 5.5.).

5 - Unscrew the lower self-locking nut and slide off all the parts fitted to the head downstream rollers shaft.

6 - Remove tha shaft, pushing it upwards. Remove the upper bearing.

7 - Remove the roller-pulley group and fit the new belt.

4.2. - REPLACEMENT

- Fit all items removed at point 4.1 following the reverse order.

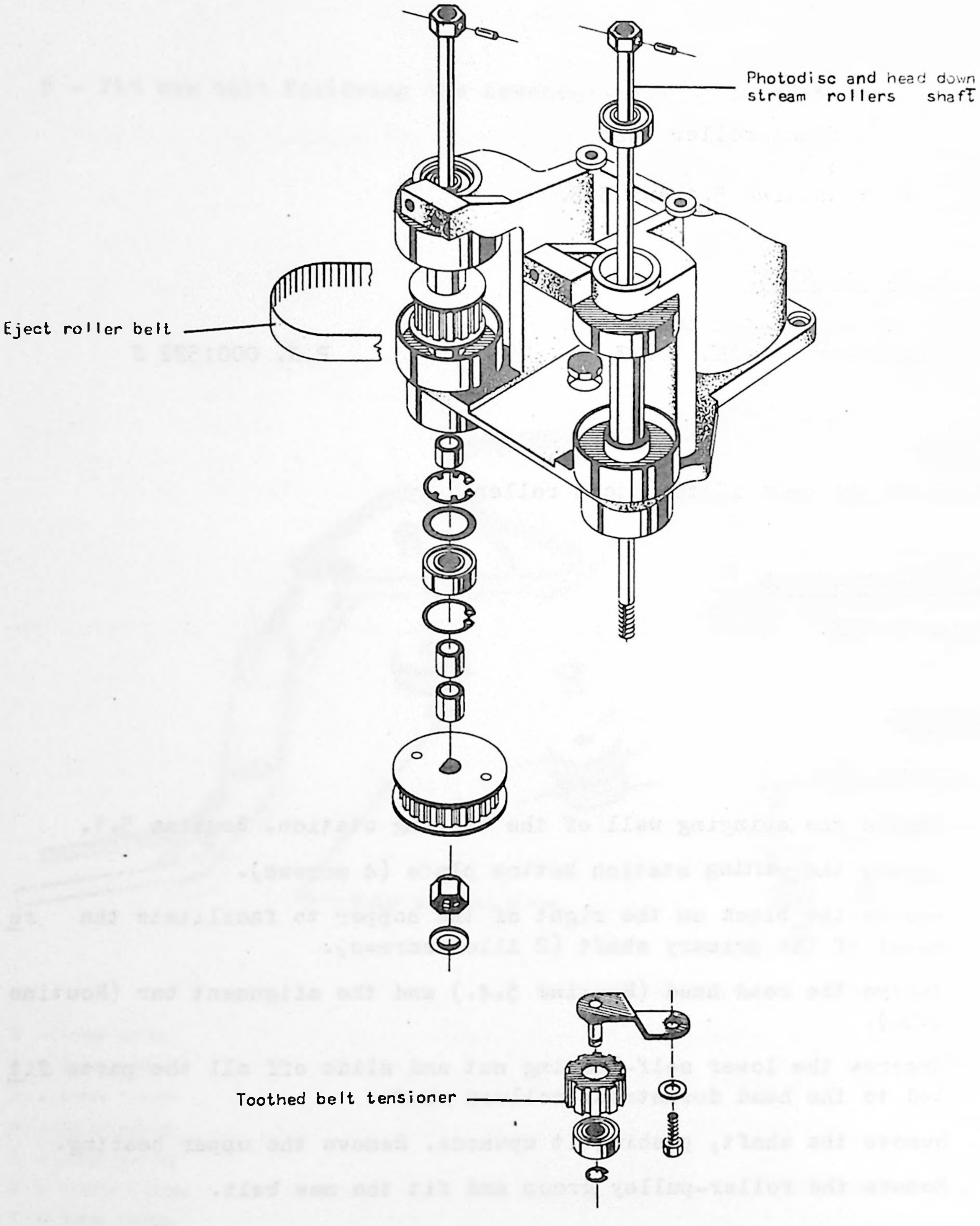


Fig. 5.10. - Head input rollers

5 - FINAL CHECKS

1 - Fit the belt on the pulley coaxial to the eject roller.

2 - Adjust the tension of the belt by moving the feed block after having slackened the 6 screws under the machine bed.

ROUTINE : 5.9

NAME : Photodisc shaft belts
DURATION : 2.0 hrs
PREREQUISITES : Routine 5.6.

1 - TOOLS AND MATERIALS

- Tool kit and system tools
- Toothed belts. Routine 5.7. points 1.2.

2 - PURPOSE

- Replace the belts of the photodisc shaft.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Remove the photodisc assembly. Routine 5.6.

2 - Carry out Routine 5.7 point 4.1 for the substitution of an inner belt and Routine 5.7 point 4.2 for an outer belt.

3 - Adjust the belt tensioner as per Routine 4.18.

5 - FINAL CHECKS

- None.

ROUTINE : **5.10**

NAME : Stacker shaft belt
DURATION : 2.0 hrs
PREREQUISITES : None

1 - TOOLS AND MATERIALS

- Tool kit and system tools
- Toothed belt 120XL 0.37 P.N. 005101 H

2 - PURPOSE

- To replace the stacker shaft drive belt.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Remove the eject stacker chromed cover (2 screws).

2 - Remove the belt idler.

3 - Unscrew the self-locking nut on the helical gear shaft.
Hold the shaft from the top on the flat.

4 - Retain the distance piece placed under the nut.

5 - Using either an aluminium or a wood drift, drive the shaft upwards.
Keep pressure on upper bearing so not to damage the rails.
If the bearing can not be extracted proceed as follows:

a - Remove the optics group positioned on the input side of the eject stacker by unscrewing the thumb screw.
b - Remove the rails and the distance pieces secured by two bolts.
c - Remove now the shaft together with bearing.

6 - Retain the worm screw and the distance pieces.

7 - Fit the new belt and follow the chosen inverse order of above for replacement.

8 - Lubricate the pinions. Routine 3.2. point 4.6.1.

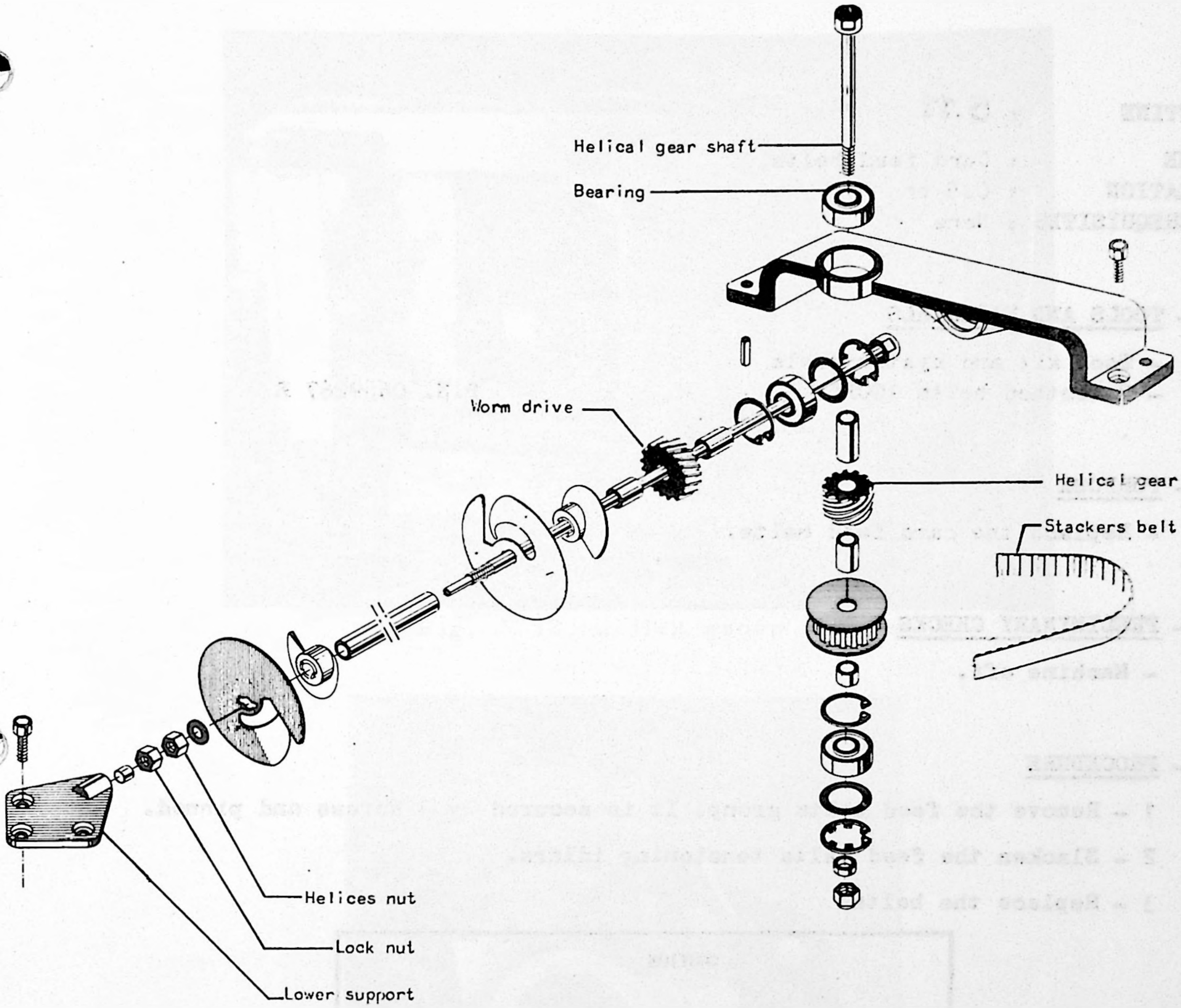


Fig. 5.11. – Stackers shafts exploded view

5 – FINAL CHECKS

- Adjust the belt idler tensions. Routine 4.18.

ROUTINE : **5.11**

NAME : Card feed belts
DURATION : 0.5 hr
PREREQUISITES : None

1 - TOOLS AND MATERIALS

- Tool kit and system tools
- 2 toothed belts 100XL P.N. 0689267 E

2 - PURPOSE

- Replace the card feed belts.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

1 - Remove the feed belts group. It is secured by 3 screws and pinned.

2 - Slacken the feed belts tensioning idlers.

3 - Replace the belts.

CAUTION

The belts must alway be changed in pairs, never singly.

4 - Adjust the feed belts tension. Routine 4.3.

5 - Replace the feed belts group ensuring that no damage is done by the vertical grub screw to the pinch roller shaft.

6 - Adjust the swinging platten. Routine 4.4.

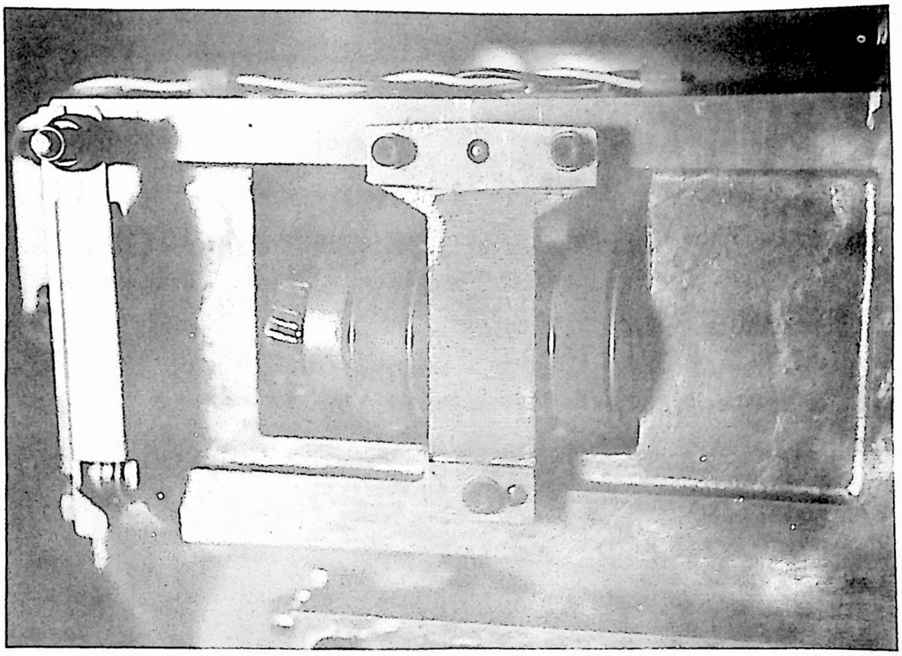


Fig. 5.12. - Belt group installed

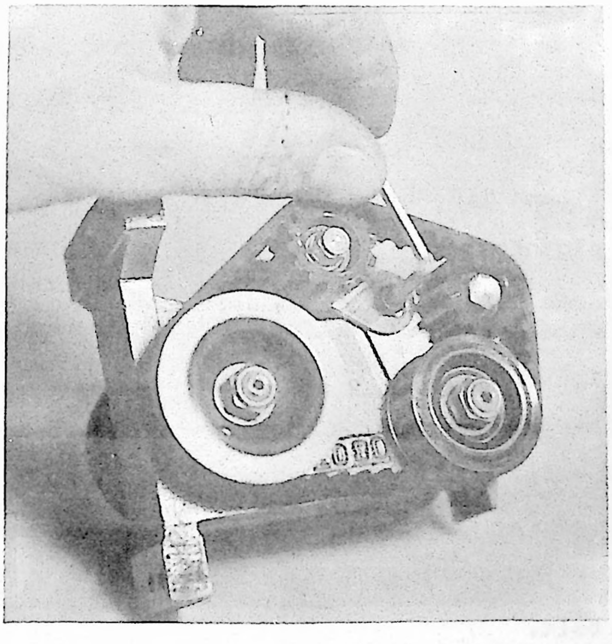


Fig. 5.13. - Belt group adjustment

5 - FINAL CHECKS

1 - Switch the machine on and feed through some cards.
2 - Ensure that no jams occur caused by wrong card feed.

ROUTINE : **5.12**

NAME : Feed head upper part
DURATION : 1.0 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- **Tool kit and system tools.**

2 - PURPOSE

- To allow the repair or the replacement of feed head components.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the left hand side of the feed hopper.

2 - Disengage the clutches.

3 - Loosen a few turns the screw on the driving belt idler of the pinch roller shaft.

4 - Remove the hopper microswitch terminals (black for common and yellow for supply).

5 - Remove the ~~two cable~~ cleats on the upper part of the head.

6 - Undo the self locking nut on the LHS of the secondary shaft.

7 - Remove the outer pulley flange.

8 - Slide off the belt.

9 - Pull off the pulley, the inner flange and the distance piece.

10 - Unhook the swinging platten command lever return spring and the spring on the locking toggle of the waiting station swinging wall.

11 - Remove the locking toggle and its circlip.

12 - Remove the locating pins.

13 - Remove the 5 fixing screws.

14 - Push the feed head downwards, rotate it to the left and, by exerting a slight pressure on the hopper sides, remove the assembly.

4.2. - REPLACEMENT

- Carry out in the reverse order, operations described at point 4.1.

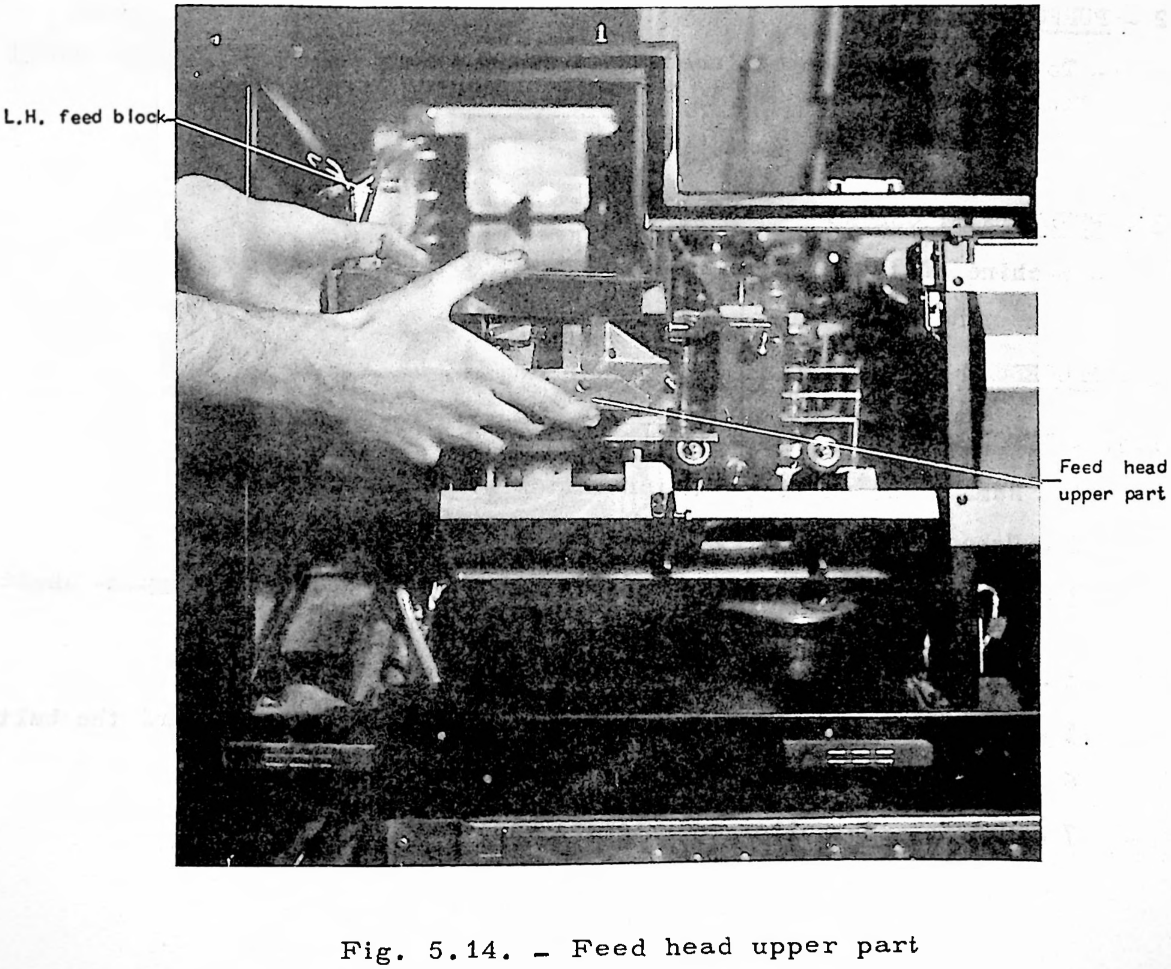


Fig. 5.14. - Feed head upper part

5 - FINAL CHECKS

- None.

ROUTINE : **5.13**

NAME : Ejeot roller support
DURATION : 3.0 hrs
PREREQUISITES : Routine 5.1.

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To allow repair or replacement of parts belonging to the roller swinging support group.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the waiting station bottom plate (4 screws).

2 - Unhook the eject roller swinging support return springs.

3 - Unscrews the two Allen screws that hold the swinging support shaft on the casting.

4 - Remove the circlip on the shaft upper extremity.

5 - Slide off the shaft from the bottom. Remove the group and the belt.

6 - Remove the self-locking nut and then the shaft.

7 - Extract the roller and its two washers.

4.2. - REPLACEMENT

1 - Lubricate the axis of the swinging support. Routine 3.2., point 4.4.1.

2 - Carry out, in the reverse order, operations described at point 4.1.

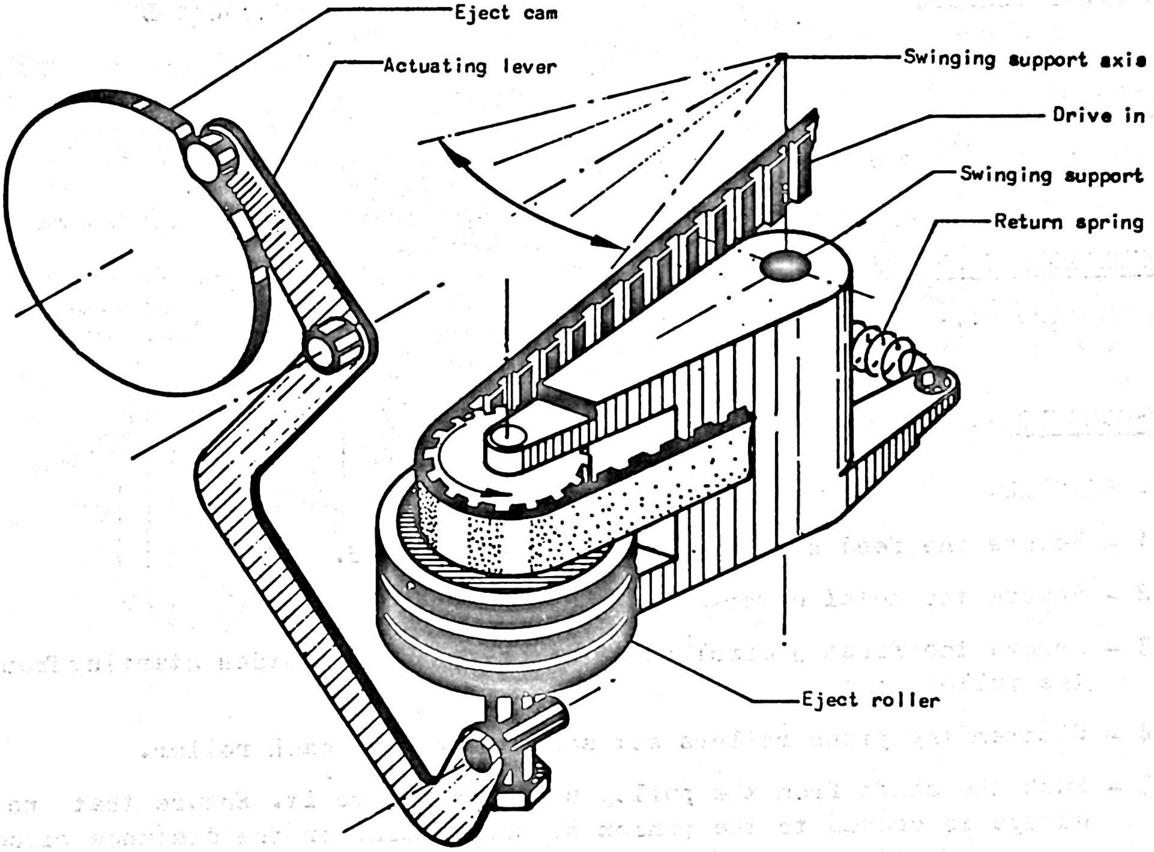


Fig. 5.15. - Eject roller

5 - FINAL CHECKS

- If the eject roller has been replaced, the eject roller is to be adjusted. Routine 4.10.

ROUTINE : **5.14**

NAME : Pinch rollers
DURATION : 1.5 hrs
PREREQUISITES : Routine 5.12.

1 – TOOLS AND MATERIALS

– Tool kit and system tools.	
– Pinch rollers	P.N. 0689011 D

2 – PURPOSE

– To replace the card pinch rollers.

3 – PRELIMINARY CHECKS

– Machine off.

4 – PROCEDURE

4.1. – REMOVAL

1 – Remove the feed head upper part. Routine 5.12.

2 – Remove the metal cover.

3 – Remove the first 3 circlips at the pinch roller sides starting from the pulley side.

4 – Slacken the pinch rollers set screws. One for each roller.

5 – Push the shaft from the pulley side and remove it. Ensure that no damage is caused to the pinion by the casting or the distance piece.

6 – Slide off the pinch rollers and the helical pinion, ensuring that no damage is caused to the shaft or to the shaped drive hole on the pinch rollers.

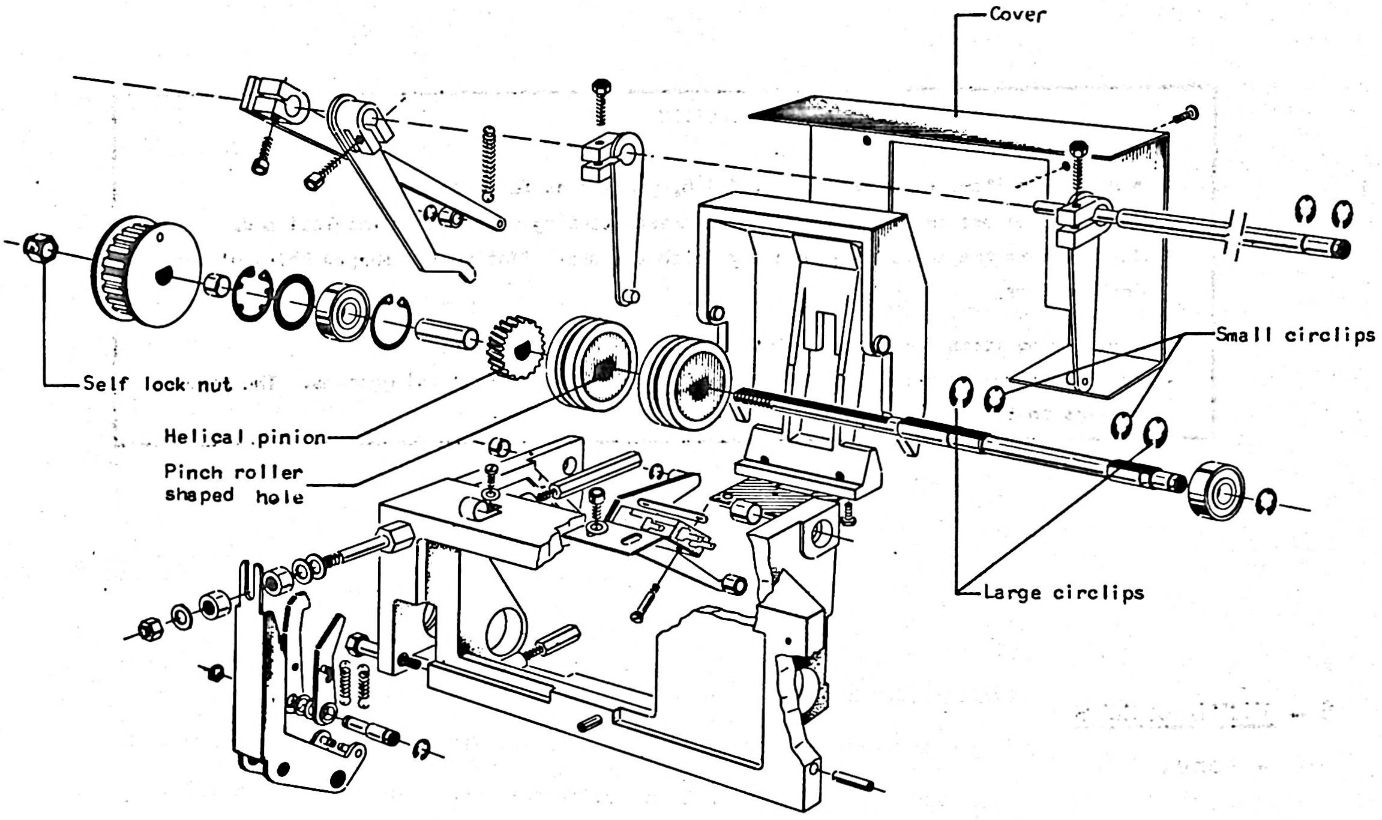


Fig. 5.16. – Pinch rollers exploded view

4.2. – REPLACEMENT

- Replace all items, in the reverse order, following sequence given in point 4.1.

CAUTION

When replacing items removed at point 4.1.6, procede as follows:

- Place the rollers and the pinion on the shaft starting from the cylindrical end. Slowly rotate the shaft to accurately match the shaft flat to the shaped holes of the pinch rollers.

When replacing items removed at point 4.1.3, procede as follows:

- The small circlips are to be fitted to the inner (to the rollers) grooves. The large circlips to the outer grooves.

5 – FINAL CHECKS

- None.

ROUTINE : **5.15**

NAME : Camshaft
DURATION : 1.0 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To allow the repair or replacement of items belonging to the camshaft.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the hopper bottom plate and the throat slide.

2 - Unhook all the cam levers and cam pawls return spring.

3 - Unscrew the nut and counter nut from the inside using two 10 mm spanners.

4 - Unscrew the inside self-locking nut.

5 - Slide off the shaft towards the machine left.

6 - Push the clutch group invards. Remove the bearing with its cruciform coupling and the first two cams.

7 - Retain all the removed parts.

4.2. – REPLACEMENT

1 – Carry out operations described at points 2, 3, 4 and 5 in the reverse order. When mating the cruciform couplings, ensure that the cams have their reference marks corresponding to their respective rollers and make sure that the pawls are engaged.

2 – Replace the hopper bottom plate and the throat slide.

5 – FINAL CHECKS

1 – Adjust tensioning idler tension. Routine 4.18.

2 – Adjust front slide. Routine 4.8.

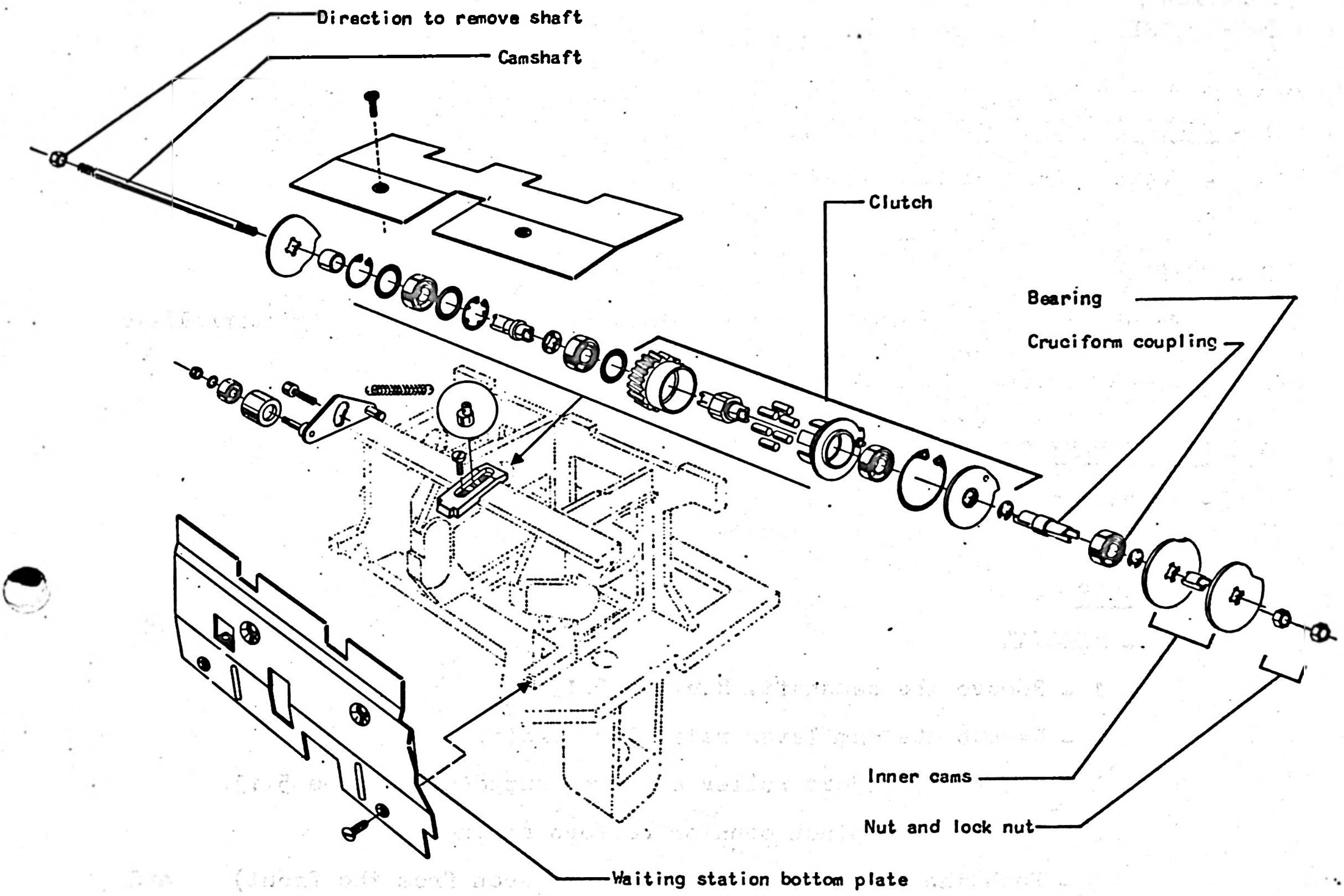


Fig. 5.17. – Camshaft exploded view

ROUTINE : 5.16

NAME : Pinch counterrollers - alignment and eject levers.
DURATION : 5.0 hrs
PREREQUISITES : Routines 5.15. and 5.13.

1 - TOOLS AND INSTRUMENTS

- Engineer's tool kit.

2 - PURPOSE

- To allow the replacement of items belonging to the pinch counterrollers and shaft group.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the camshaft. Routine 5.15.

2 - Remove the cam lever retaining circlips.

3 - Remove the eject roller swinging support. Routine 5.13.

4 - Un-hook the pinch counter rollers springs.

5 - Push the shaft towards the right (seen from the front) and slide off the left hand counterroller lever.

6 - Push the shaft towards the left to remove the right hand counterroller lever.

7 - Push the shaft even further (towards the left) to eventually remove the eject and aligment levers.

4.2. - REPLACEMENT

1 - Carry out the operations at point 4.1. in the reverse order.

2 - Lubricate the shaft and the lever rollers. Routine 3.2. point 4.2. step 3.

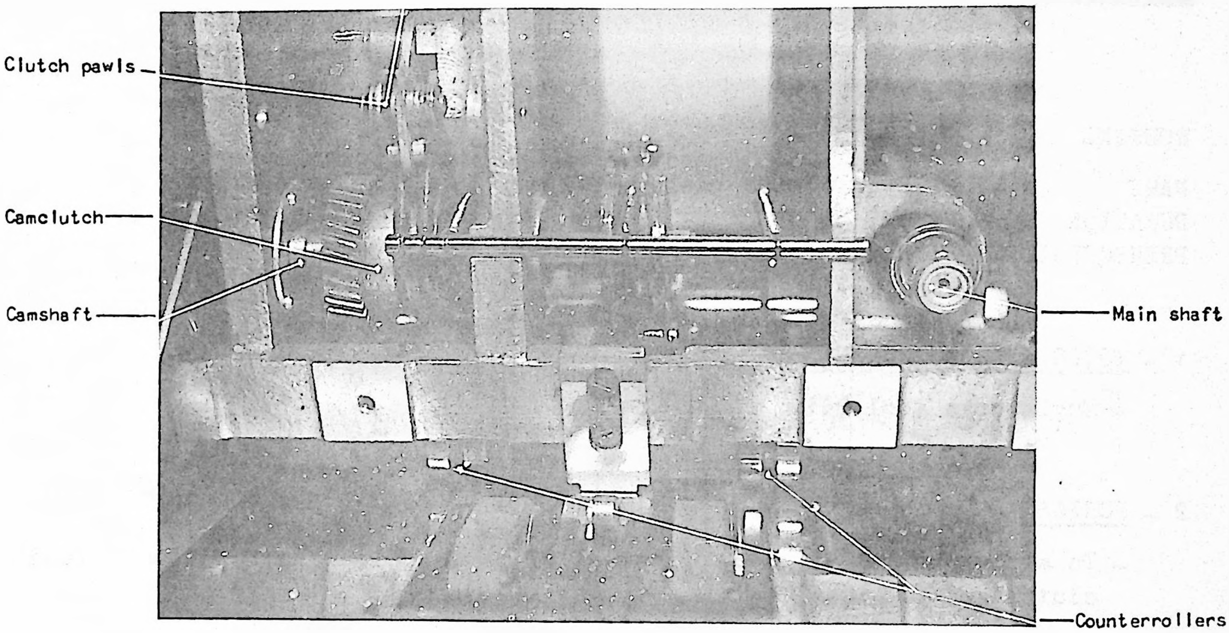


Fig. 5.18. - Pinch counterrollers

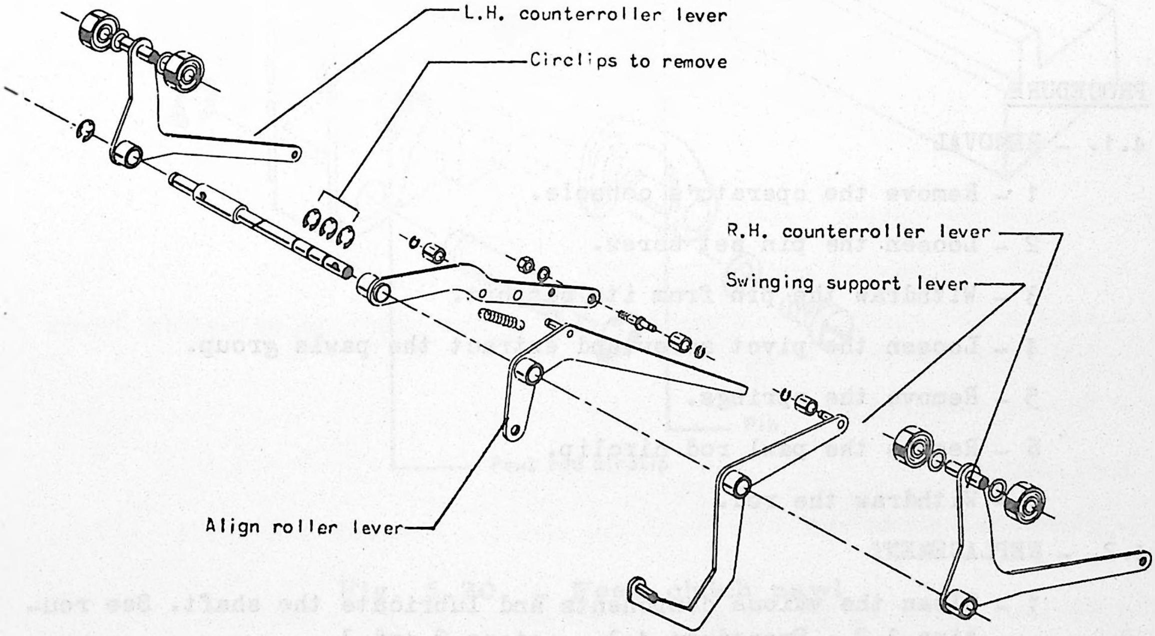


Fig. 5.19. - Eject roller levers

5 - FINAL CHECKS

1 - Switch the machine on and feed through same cards.

2 - Check that cards do not become jammed in the waiting station.

ROUTINE : **5.17**

NAME : Feed clutch pawls
DURATION : 0.5 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Engineer's tool kit.

2 - PURPOSE

- To allow the repair or replacement of parts belonging to the feed clutch group.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the operator's console.

2 - Loosen the pin set screw.

3 - Withdraw the pin from its support.

4 - Loosen the pivot screw and extract the pawls group.

5 - Remove the springs.

6 - Remove the pawl rod circlip.

7 - Withdraw the rod.

4.2. - REPLACEMENT

1 - Clean the various components and lubricate the shaft. See routine 3.2. Procedure 4.3. - steps 2 and 3.

2 - Replace by following the removal steps 7 through 1 and carrying out the operations in the reverse order.

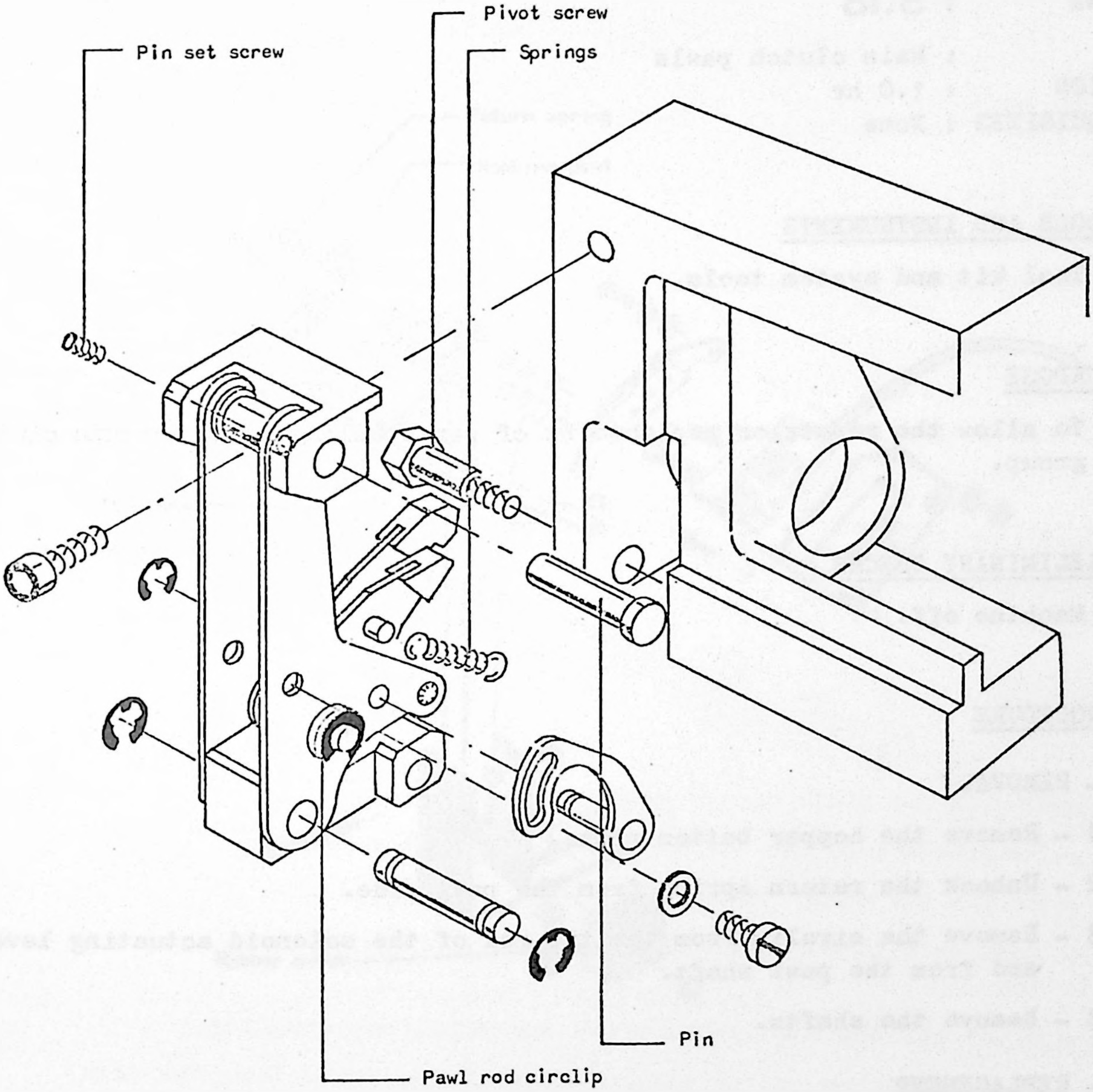


Fig. 5.20. – Feed clutch pawl

5 – FINAL CHECKS

– None.

ROUTINE : 5.18

NAME : Main clutch pawls
DURATION : 1.0 hr
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To allow the repair or replacement of parts belonging to the main clutch group.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the hopper bottom plate.

2 - Unhook the return spring from the pawl side.

3 - Remove the circlip from the tie rod of the solenoid actuating lever and from the pawl shaft.

4 - Remove the shafts.

4.2. - REPLACEMENT

1 - Clean all parts and lubricate the shafts. Routine 3.2. point 4.2. , step 1.

2 - Replace items in the reverse order described at point 4.1.

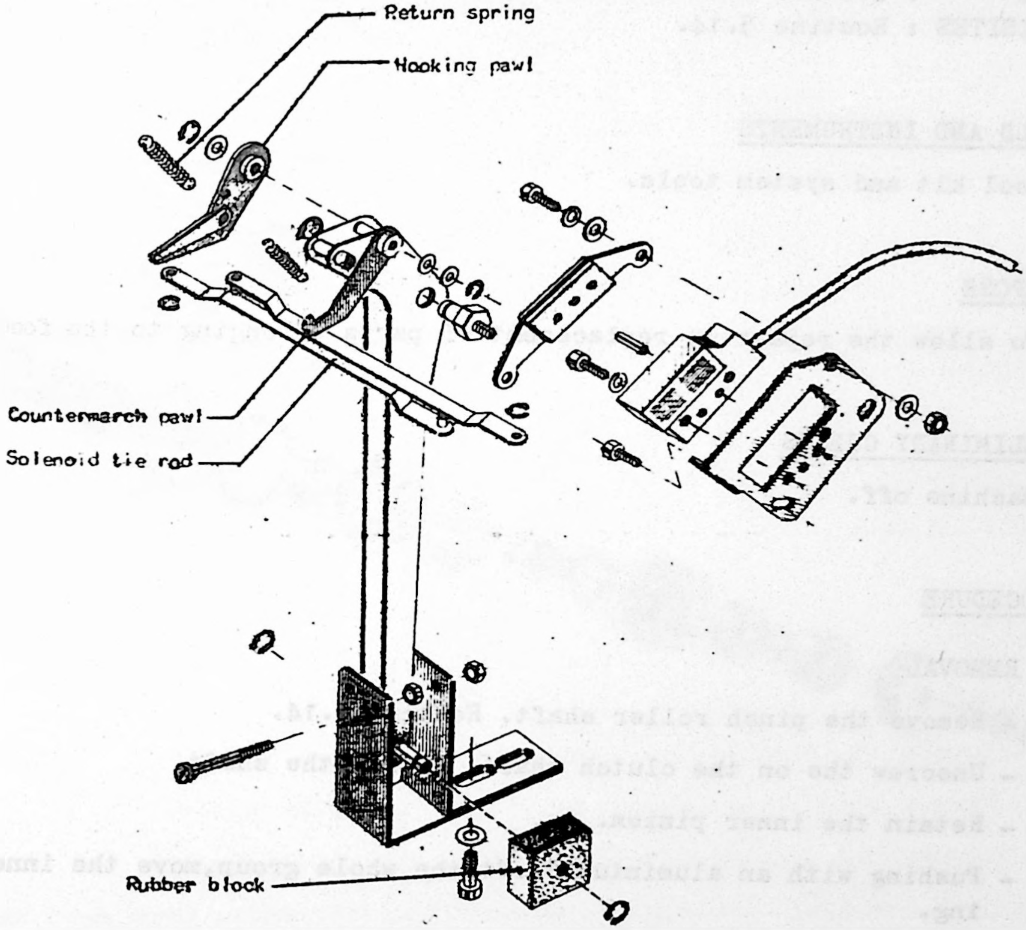


Fig. 5.21. – Main clutch pawls

5 – FINAL CHECKS

- None.

ROUTINE : **5.19**

NAME : Feed clutch
DURATION : 4.0 hrs
PREREQUISITES : Routine 5.14.

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To allow the repair or replacement of parts belonging to the feed clutch.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the pinch roller shaft. Routine 5.14.

2 - Unscrew the on the clutch shaft. Remove the shaft.

3 - Retain the inner pinion.

4 - Pushing with an aluminium drift the whole group,move the inner bearing.

5 - Slide off the cam group, crown and cruciform coupling.

6 - To gain access to the clutch, detatch the crown from the cams.

4.2. - REPLACEMENT

- Replace items in the reverse order described at point 4.1.

NOTE

Particular attention is to be exercised when mating the components of the cruciform coupling.

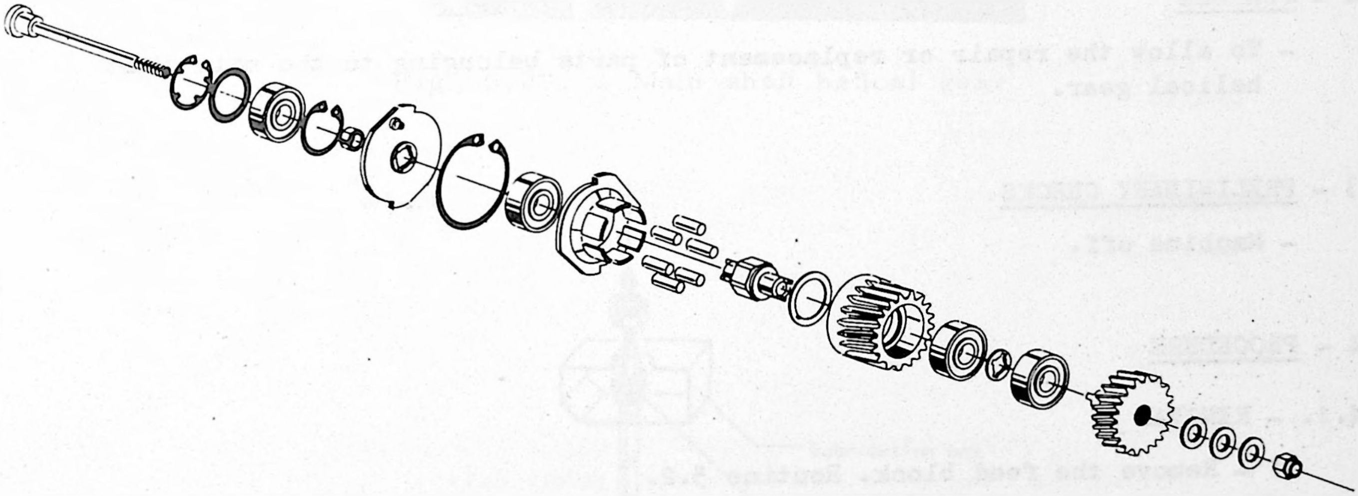


Fig. 5.22. – Feed clutch exploded

5 – FINAL CHECKS

– None.

ROUTINE : **5.20**

NAME : Main shaft helical gear
DURATION : 4.0 hrs
PREREQUISITES : Routine 5.2.

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To allow the repair or replacement of parts belonging to the main shaft helical gear.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the feed block. Routine 5.2.

2 - Remove the hopper bottom plate and the front slide.

3 - Remove the lubrication box lid.

4 - Push the shaft upwards, tapping it if necessary. Care must be taken not to damage the oil sealing ring. Retrieve the distance piece on the shaft.

5 - Remove the bearing and the helical gear.

4.2. - REPLACEMENT

1 - Replace items in the reverse order described at point 4.1.

> NOTE
>
> When replacing the oil seal, care must be taken not to pinch it.

2 - Fill with type 2 grease the lubrication box.

3 - Move the motor in the fixing slots to take up play on the belt. Tighten the fixing bolts.

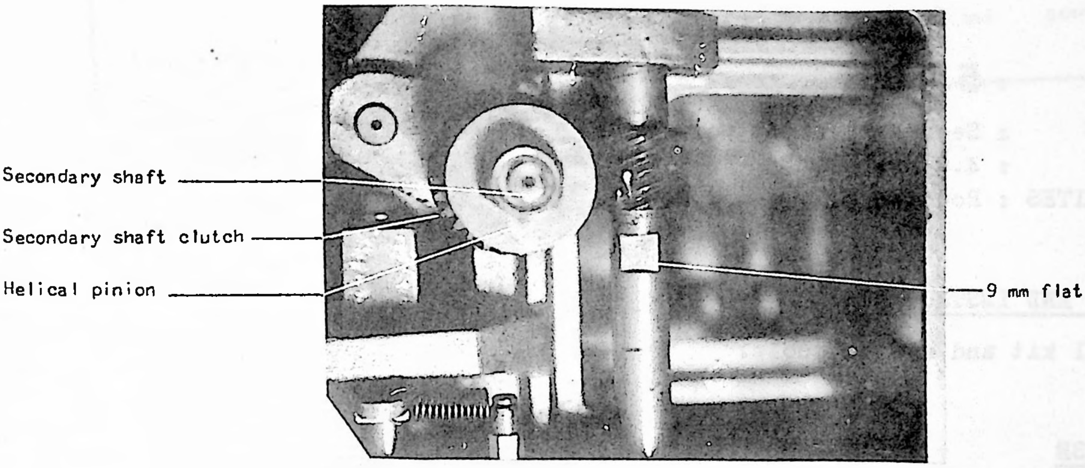


Fig. 5.23. – Main shaft helical gear

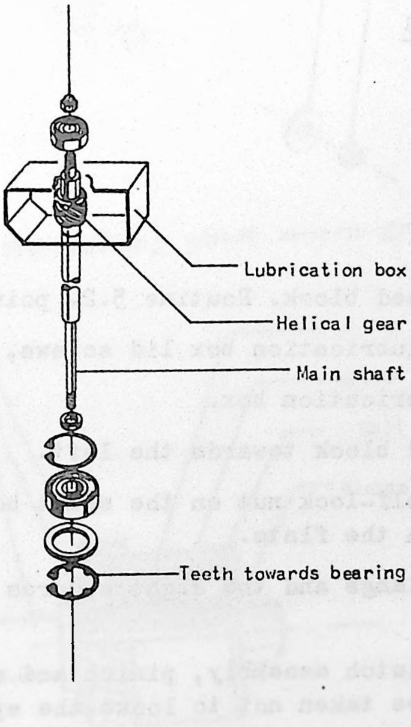


Fig. 5.24. – Main shaft components – exploded

5 – FINAL CHECKS

1 – Adjust the belt tensioner. Routine 4.18.

2 – Adjust the front slide. Routine 4.8.

ROUTINE : **5.21**

NAME : Secondary shaft worm gear
DURATION : 4.0 hrs
PREREQUISITES : Routine 5.2.

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To allow the repair or substitution of the worm gear on the secondary shaft.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the feed block. Routine 5.2. point 4.1.

2 - Unscrew the lubrication box lid screws, hence the lid.

3 - Empty the lubrication box.

4 - Tilt the feed block towards the left.

5 - Remove the self-lock nut on the shaft holding the latter with a 9 mm OE spanner on the flats.

6 - Remove the flange and the eight spheres that protrude from the pinion gear.

7 - Remove the clutch assembly, pinion and shouldered sleeve.
Care should be taken not to loose the springs, washers and spheres.

4.2. - REPLACEMENT

1 - Replace items in the reverse order described at point 4.1.

NOTE

To ease replacement operations of the clutch pack with grease the cavity of the gear before fitting the spheres, washers and springs.

2 - Fill the clutch lubrication box with type 2 grease.

3 - Replace the feed block. Routine 5.2. point 4.2.

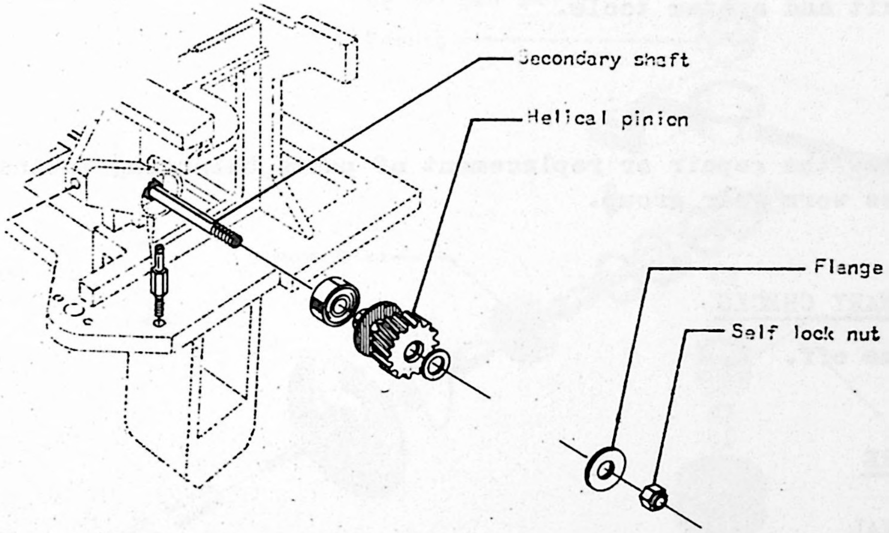


Fig. 5.25. - Secondary shaft worm gear

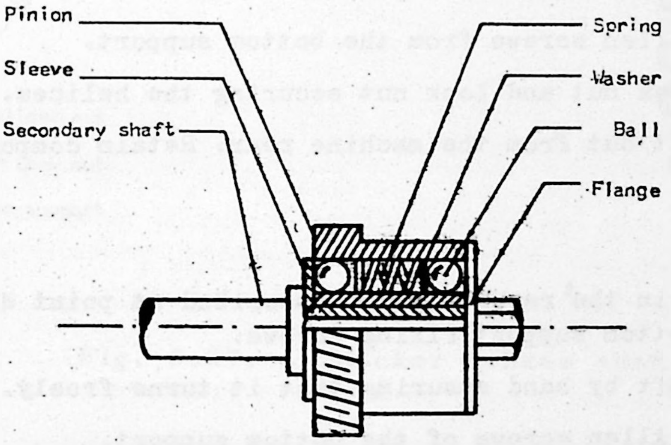


Fig. 5.26. - Ball clutch

5 - FINAL CHECKS

- Check for correct operation of the group. Routine 4.24.

ROUTINE : 5.22

NAME : Stacker helices worm gear
DURATION : 2 hrs
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To allow the repair or replacement of parts belonging to the stacker helices worm gear group.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the cover from the top of the eject stacker.

2 - Remove the stacker two bottom plates.

3 - Remove the 3 Allen screws from the bottom support.

4 - Unscrew the lock nut and lock nut securing the helices.

5 - Slide the shaft out from the machine rear. Retain components fitted onto it.

4.2. - REPLACEMENT

1 - Replace items in the reverse order described at point 4.1. Do not tighten the bottom support fixing screws.

2 - Rotate the shaft by hand ensuring that it turns freely.

3 - Tighten the 3 Allen screws of the bottom support.

4 - Lubricate the pinion. Routine 3.2., point 4.6., step 1.

5 - Replace the stacker bottom plates and the eject stacker cover.

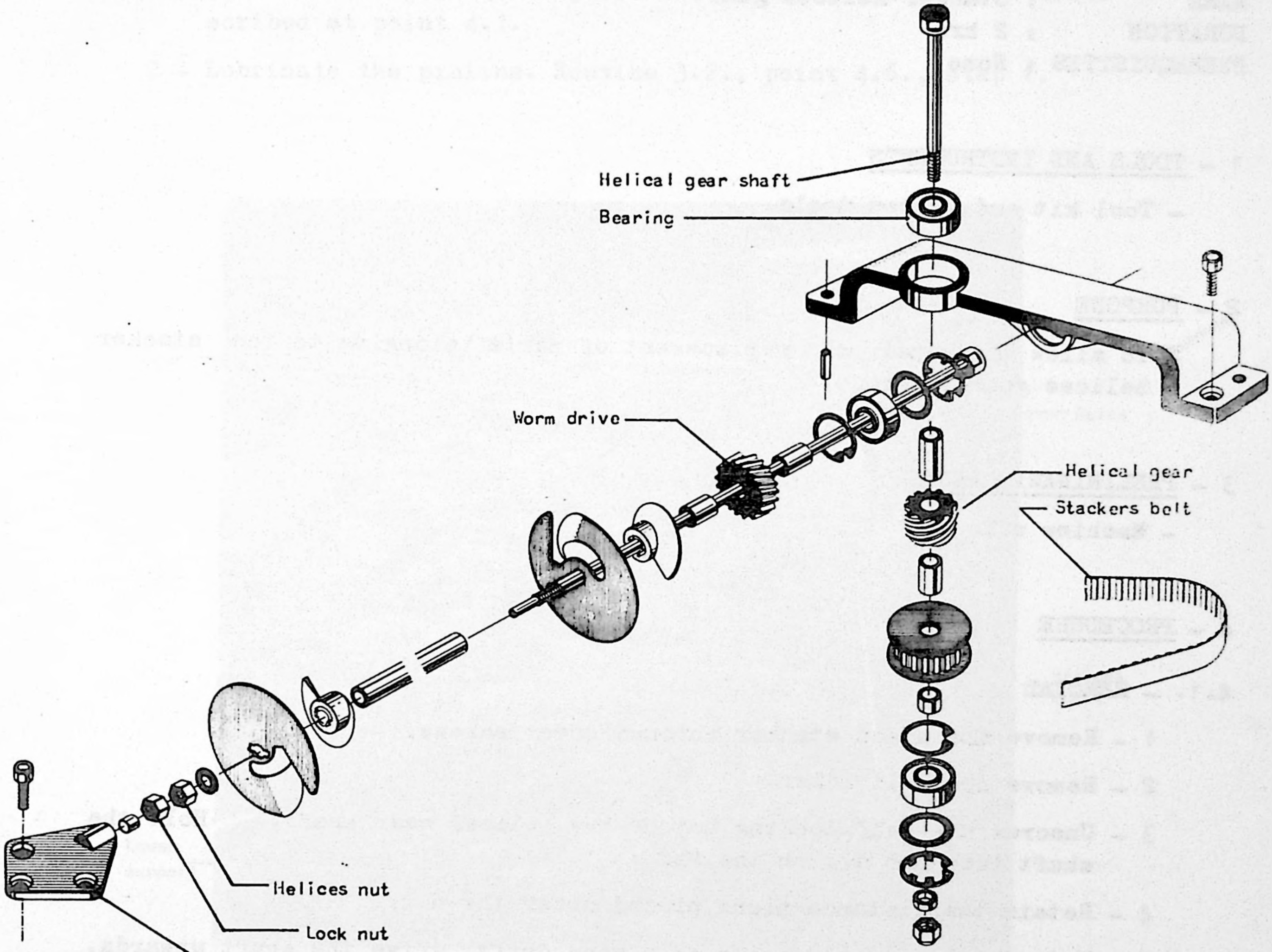


Fig. 5.27. – Stacker helices shaft

5 – FINAL CHECKS

– None.

ROUTINE : 5.23

NAME : Stacker helices gear
DURATION : 2 hrs
PREREQUISITES : None

1 - TOOLS AND INSTRUMENTS

- Tool kit and system tools.

2 - PURPOSE

- To allow the repair or replacement of parts belonging to the stacker helices gearing group.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Remove the eject stacker chromed cover screws.

2 - Remove the belt idler.

3 - Unscrew the self-locking nut or the helical gear shaft. Hold the shaft from the top on the flat.

4 - Retain the distance piece placed under the nut.

5 - Using either an aluminium or a wood drift, drive the shaft upwards. Keep pressure on the upper bearing so not to damage the rails. If the bearing can not be extracted easily, proceed as follows:

  a - Remove the optics group positioned on the input side of the eject stacker by unscrewing the thumb screw.

  b - Remove the rails and the distance pieces secured by the bolts.

  c - Remove now the shaft together with the bearing.

6 - Retain the work screw and the distance pieces.

4.2. - REPLACEMENT

1 - Slide on the belt and replace all items in the reverse order described at point 4.1.

2 - Lubricate the pinions. Routine 3.2., point 4.6., step 1.

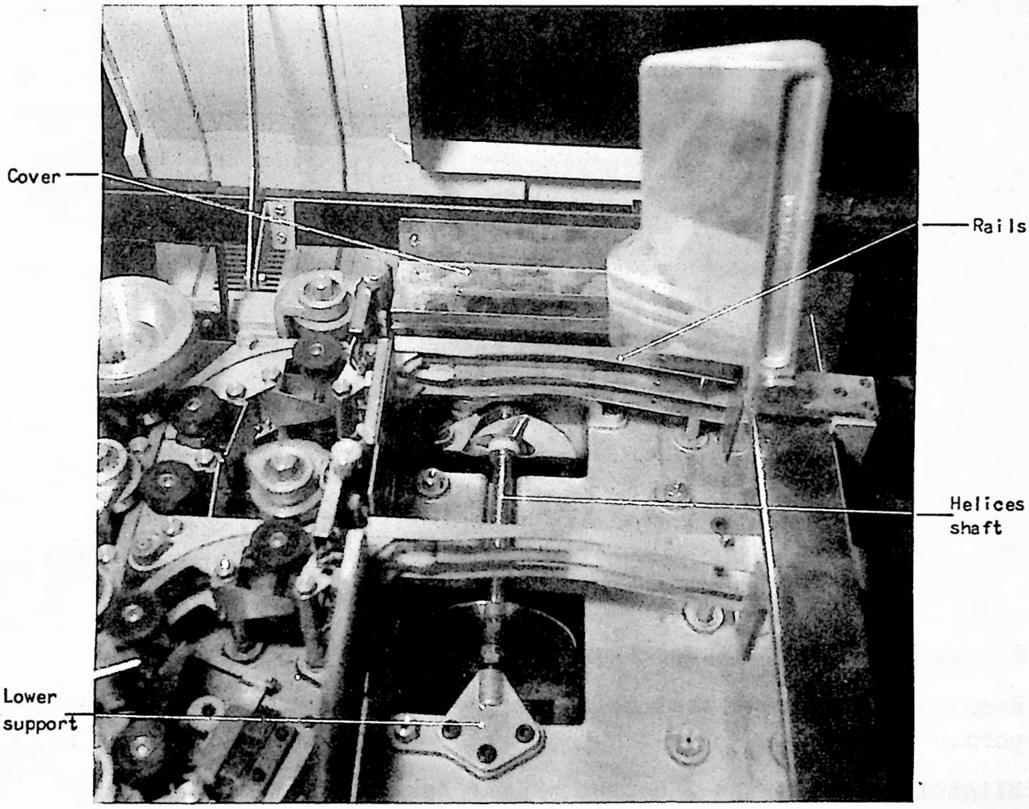


Fig. 5.28. - Stacker helical gears

5 - FINAL CHECKS

- Adjust belt tension. Routine 4.18.

ROUTINE : **5.24**

NAME : Read photocell
DURATION : 2.0 hrs
PREREQUISITES : None

1 - TOOLS AND MATERIALS

- Tool kit and system tools.
- Scope.
- Photocell BPY10 40 to 8 µA P.N. 5854215 G

2 - PURPOSE

- To replace a photocell.

3 - PRELIMINARY CHECKS

- Machine off.

4 - PROCEDURE

4.1. - REMOVAL

1 - Unscrew the head group knurled thumb screws.

2 - Remove the cover by unscrewing the two screws.

3 - Remove the 2 screws that hold the photocell housing to the head support.

4 - Slightly slacken the 7 screws of the bakelite cover.

5 - Take the photocell out and unsolder it.

4.2. - REPLACEMENT

1 - Replace the photocell.

CAUTION

The terminal individuated with a red spot, is to be connected to common.

2 - Carry out in reverse sequence operations described at point 4.1., steps 4 and 5.

3 - Fit the cell housing pushing down and to the right before tightening the screws.

4 - Carry out in sequence operations described at steps 1 and 2.

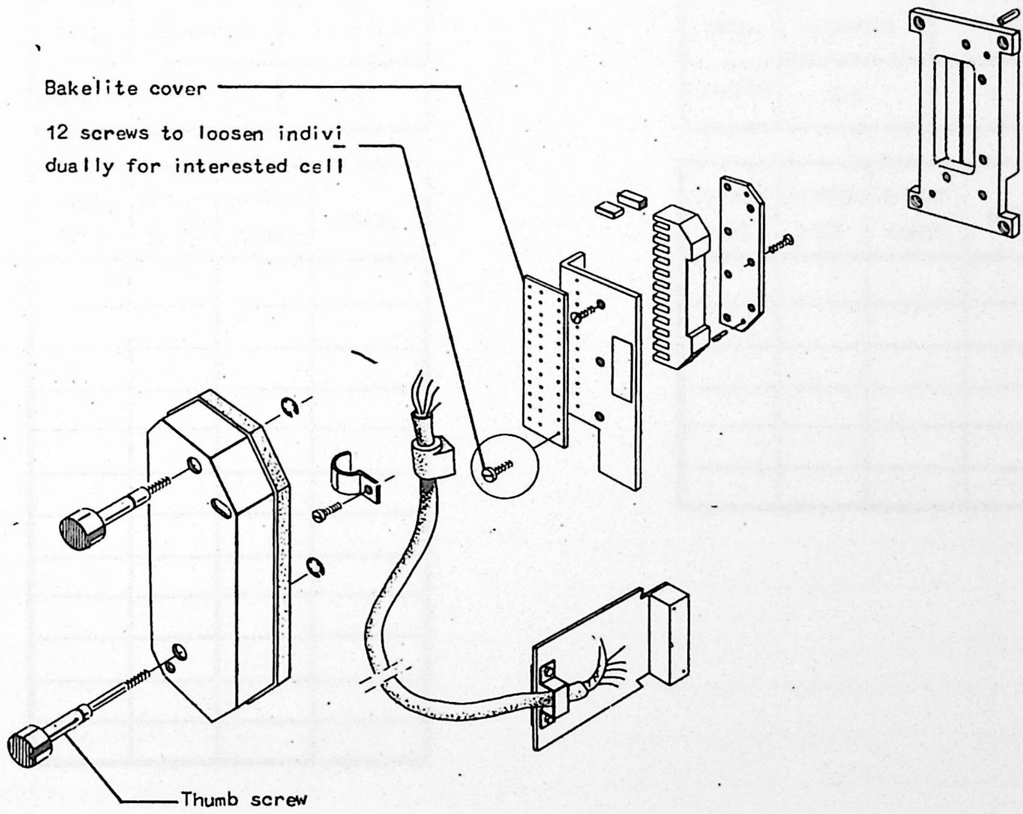


Fig. 5.29. - Head photocell detail

5 - FINAL CHECKS

- Set up the read signal corresponding to the replaced cell.Routine 4.34.

GENERAL ELECTRIC
GENERAL ELECTRIC INFORMATION SYSTEMS ITALIA

LS 400
LS 600
CRD 160

PREVENTIVE MAINT. LOG

YEAR MACHINE TYPE and SERIAL No.

MAINTENANCE TYPE **F** Approx. duration 1 h.h/10		
FREQ.	2 months	3 months
SHIFTS	3	1-2

SCHED. DATE	EFFECT. DATE	EFFECT. DURAT.	ENGR.

MAINTENANCE TYPE **H** Approx. duration 3 h.b/10		
FREQ.	6 months	Annual
SHIFTS	2-3	1

SCHED. DATE	EFFECT. DATE	EFFECT. DURAT.	ENGR.

PIECE		REPL. FREQ. (hours)	SCHEDULED REPLACEMENTS					
Feed belts	0689267 E	450						
Read lamp	0001749 E	1.200						
Eject roller lever	0689073 K	3.000						
Swinging platten	0688058 B	3.000						
Alignment roller lever	0689017 N	3.000						
Eject roller	0689167 C	3.000						

DATE	NOTES

Mod. 0144

GENERAL ELECTRIC
GENERAL ELECTRIC INFORMATION SYSTEMS ITALIA

LS 400
LS 600
CRD 160

MAINTENANCE SCHEDULE TYPE F

SPECIAL TOOLS	. Roller gauge	P.N. 0688773 L
	. Special roller socket wrench	P.N. 0686798 L

MACHINE OFF OPERATIONS

1. CLEANING

a) - Read the notes listed on the Preventivo Maintenance Log

b) - Check that the operator has cleaned:

- hopper, track and stackers (1.1.4.1)
- read group (1.1.4.2 and 3)
- feed belts and wait station idlers (1.1.4.4)

2. SCHEDULED REPLACEMENTS

In accordance with the Preventive Maintenance Log and subsystem elapsed time counter, check and replace:

a) - read lamp (2.5.4.1.2 and 3)

b) - feed belts (2.1.4.3)

3. LUBRICATION

Lubricate as per lubrication plan:

a) - main clutch : pawls, gears, cams (3.2.4.2)

b) - feed clutch : pawls, gears, cams (3.2.4.3)

4. CHECKS

Proceed to check:

a) - hopper card flute freedom (2.1.4.1 and 2)

b) - feed belts/swinging platten alignment with index cam on P (2.1.4.4)

c) - pinch roller surfaces and idler roller freedom (2.4.4.3 and 4)

MACHINE ON OPERATIONS

5. FUNCTIONAL CHECKS

Proceed to check:

a) - card transport over entire track (2.9.4)

b) - read signals ALXX-350 μs (2.10.4.5)

c) - one-shot RIPE and general operation with auto-sync disabled (2.10.4.5)

d) - lamp supply margins (2.10.4.7)

e) - fill in the Preventive Maintenance Log and appropriate service report.

Note

Reference numbers, in brackets, refer to Maintenance Manual P.N. 4.896.4.000. A.
The pertinent Preventive Maintenance Log has P.N. 4033.4.060.6/A

GENERAL ELECTRIC
GENERAL ELECTRIC INFORMATION SYSTEMS ITALIA

LS 400
LS 600
CRD 160

MAINTENANCE SCHEDULE TYPE H

SPECIAL TOOLS			
	. Roller gauge	P.N.	0688773 L
	. Spring gauge	P.N.	0688796 T
	. Special roller socket wrench	P.N.	0688798 L
	. Dynamometer	P.N.	4355415 R

MACHINE OFF OPERATIONS

1. GENERAL CLEANING

a) - Read the notes listed on the Preventive Maintenance Log

b) - Check that the operator has cleaned:
  - hopper, track, stackers (1.1.4.1)
  - read group (1.1.4.2 and 3)
  - feed belts and wait station (1.1.4.4)

c) - Proceed to clean:
  - base plates and main deck surfaces (3.1.4.1)
  - feed head (3.1.4.2)

2. SCHEDULED REPLACEMENTS

In accordance with the Preventive Maintenance Log and subsystem elapsed time counter, check and replace:

a) - read lamp (2.5.4.1.2 and 3)
b) - feed belts (2.1.4.3)
c) - eject and alignment cams levers and rollers (5.16)
d) - eject roller (5.13)
e) - swinging platten

3. LUBRICATION

Lubricate as per lubrication plan:

a) - hopper : guide, swinging platten (3.2.4.1)
b) - main clutch : pawls, gears, cams (3.2.4.2)
c) - feed clutch : pawls, gears, cams (3.2.4.3)
d) - wait station: lever shaft, cruciform coupling, eject roller swinging support (3.2.4.4)

4. CHECKS

Proceed to check:

a) - feed belts/swinging plattern alignment with index cam on P (2.1.4.4)
b) - throat gap (2.1.4.5)
c) - main clutch adjustment and state of wear (2.2.4)
d) - feed clutch release (0.2mm) (2.3.4.1)
e) - alignment and eject rollers (roller-throat gauge ⩾ 0.3mm) (2.4.4.1 & 2)
f) - pinch roller surfaces and idler roller freedom (2.4.4.3 and 4)

MACHINE ON OPERATIONS

5. FUNCTIONAL CHECKS

Proceed to check:

a) - card transport over entire track (2.9.4)
b) - sync signal (FCDI-31.5 µsec - Light/No Light) (2.10.4.1 and 4)
c) - read signals ALXX - 350 µs (2.10.4.5)
d) - one-shot RIPE and general operation with auto-sync disabled (2.10.4.6)
e) - lamp supply margins (2.10.4.7)
f) - AFOT signals adjustment (2.10.4.8)

6. FINAL OPERATIONS

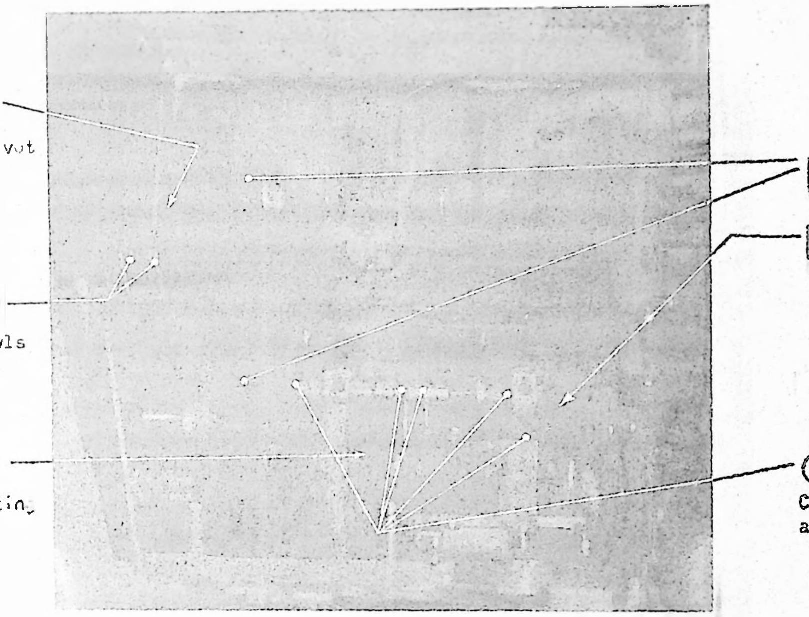
a) - Carry out the SAT program
b) - Fill in the Preventive Maintenance Log and appropriate service report.

Note

Reference numbers, in brackets, refer to Maintenance Manual P.N. 4.896.4.000. /A.
The pertinent Preventive Maintenance Log has P.N. 4.033.4.060.6/A .

LUBRICATION PLAN

LUBRICANT	③	SAE 50 oil	P.N. 0491020 G
TYPES	[2]	GL 1 grease	P.N. 0491017 R



(F, H) [2] Pawl command pivot

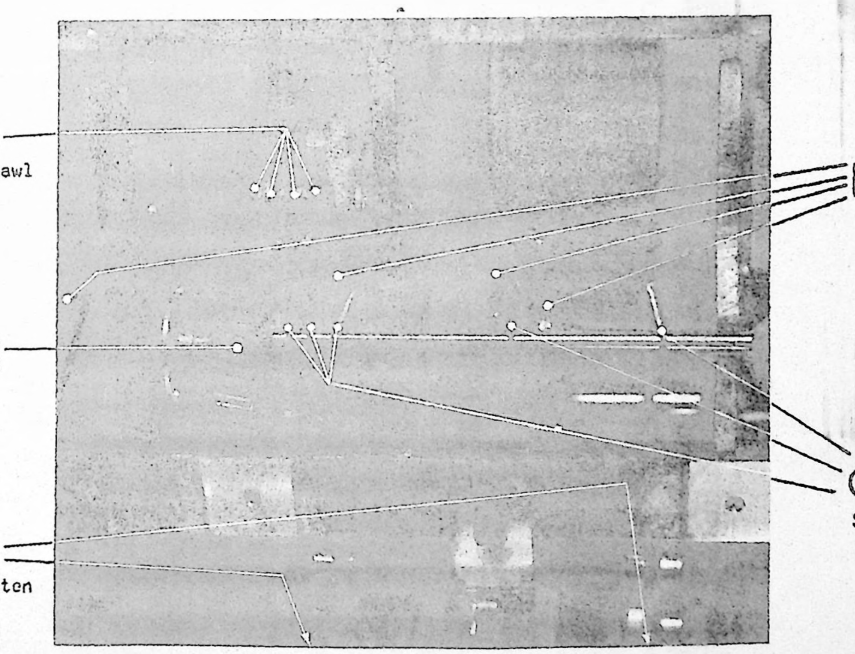
(F, H) ③ Feed clutch pawls

(H) [2] Cruciform coupling

[2] (F, H)

[2] (F, H) Fill box with greaser

③ (H) Cam shaft eject and alignment assy



(F, H) ③ Main clutch pawl axis

(F, H) [2]

(H) ③ Swinging platten bushings

[2] (F, H)

③ (H) Spring eyelets

③ (H) track and eject idlers bushings

[2] (F, H) worm - helical drive

Note: Letters in brackets indicate the pertinent Maintenance Scheduled requiring the lubrication.
Standard lubricants are foreseen. QUANTITY: ☐ ○ Little ▣ ◎ Average.

PARTS

GENERAL ELECTRIC
GENERAL ELECTRIC INFORMATION SYSTEMS ITALIA

SOTTOSISTEMA CRZ 105-111-112-120-121

Catalogo parti di ricambio

Quarta edizione

Edito a cura della
Sezione Assistenza Tecnica

4.895.5.001. 3

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Mod. 0751

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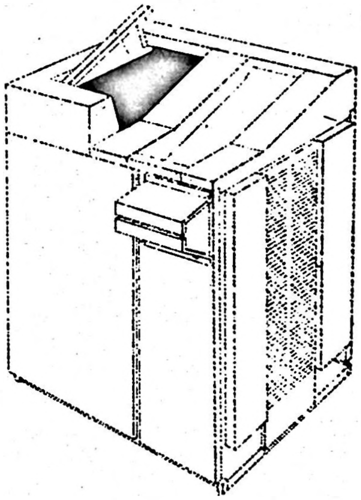

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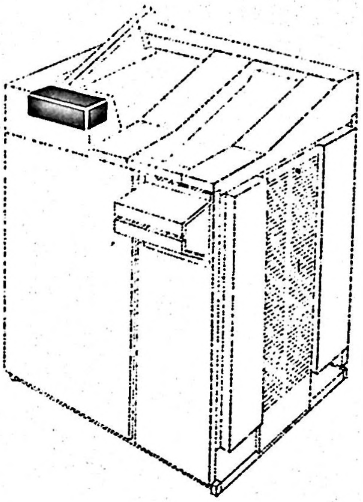

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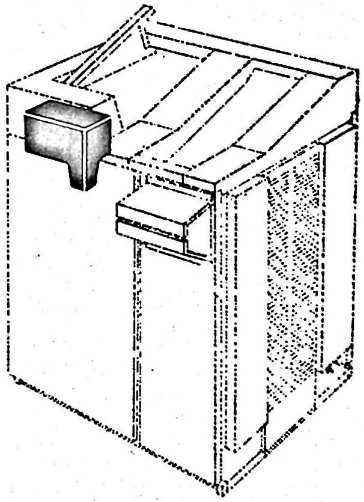

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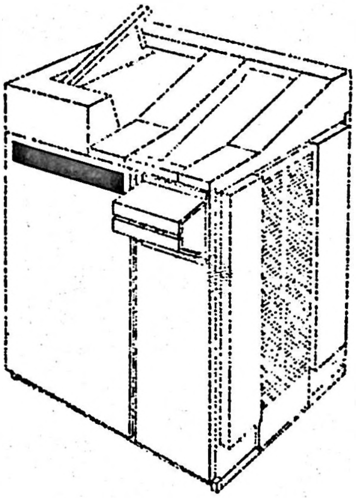

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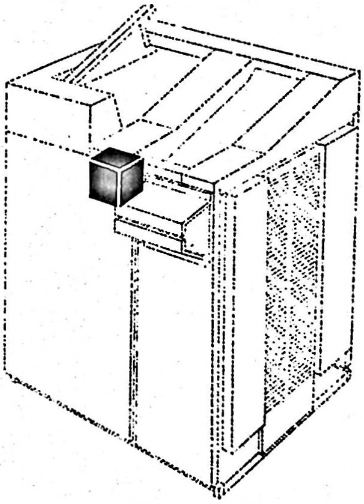

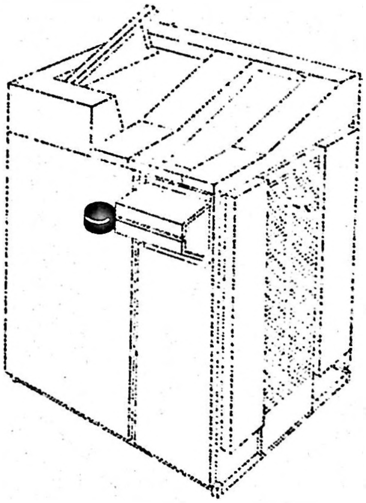

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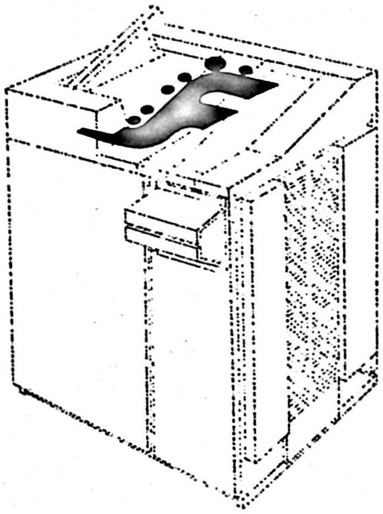

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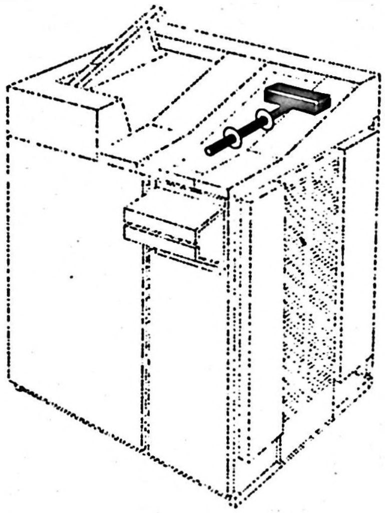

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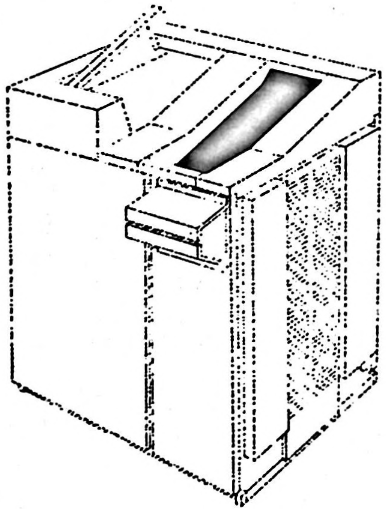

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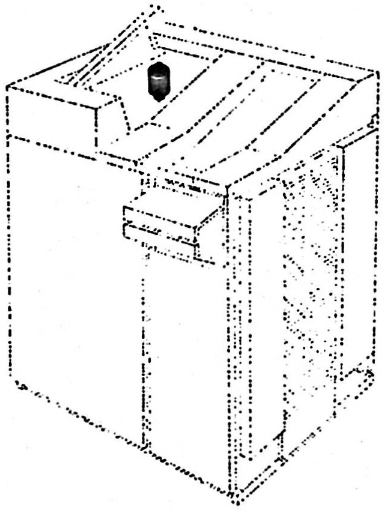

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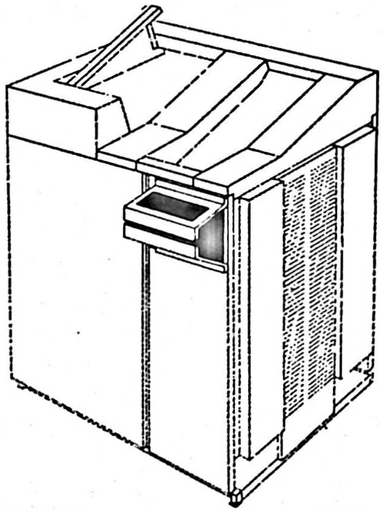

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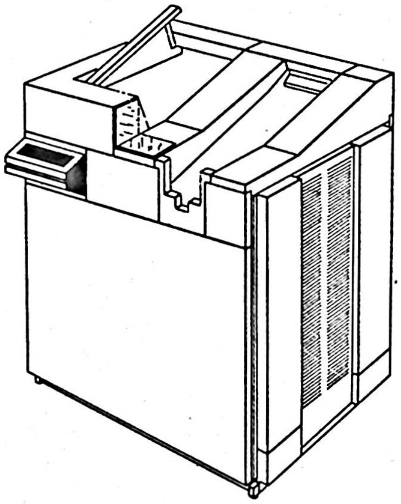

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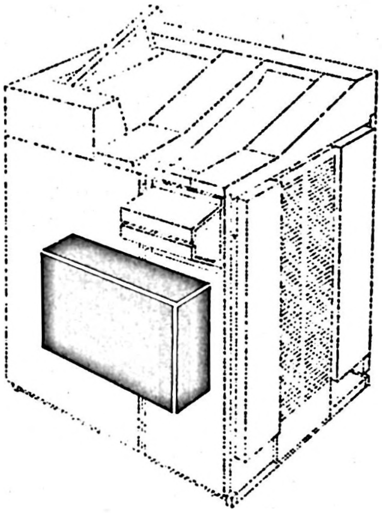

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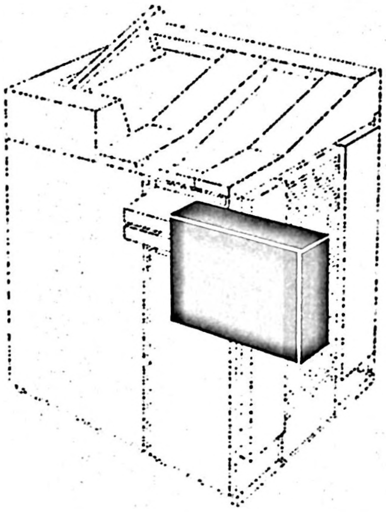

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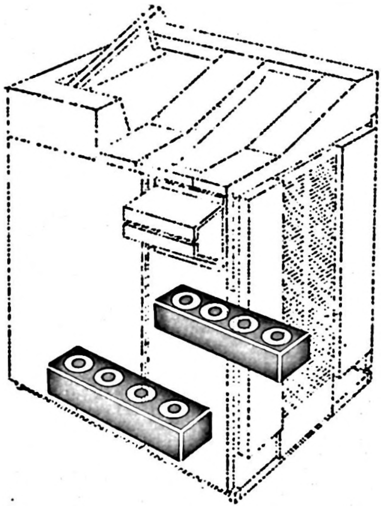

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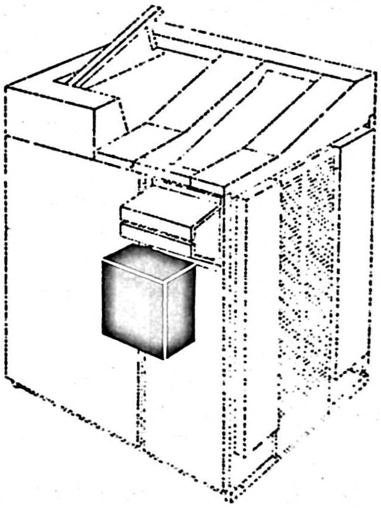

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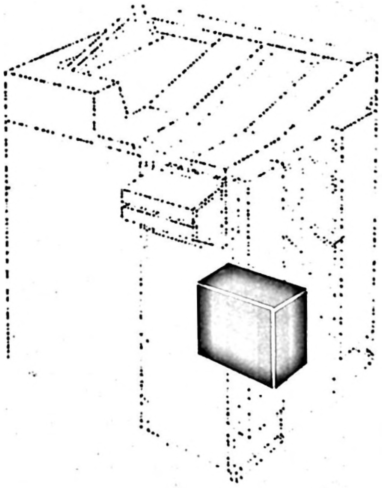

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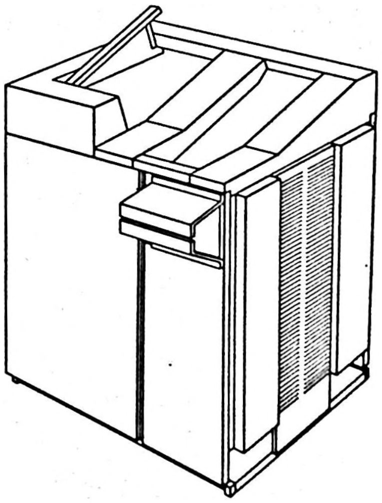

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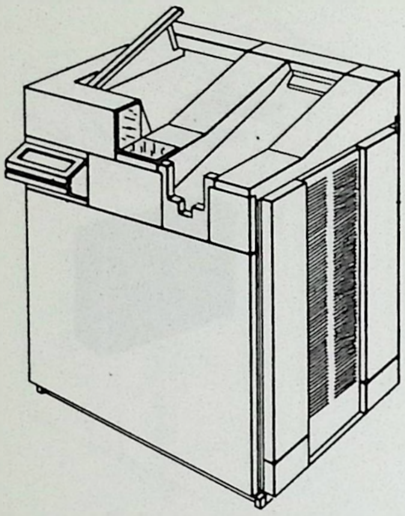

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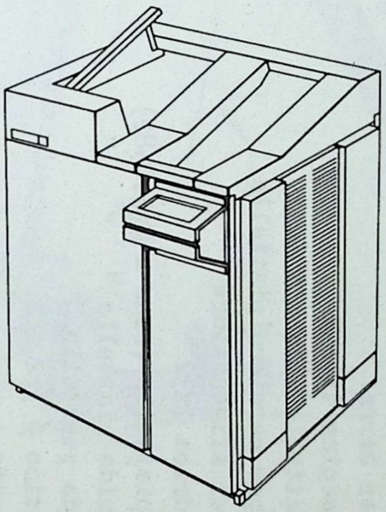
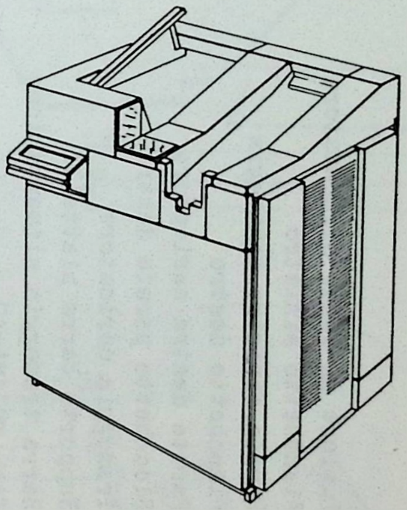
GENERAL ELECTRIC

GENERAL ELECTRIC INFORMATION SYSTEMS ITALIA

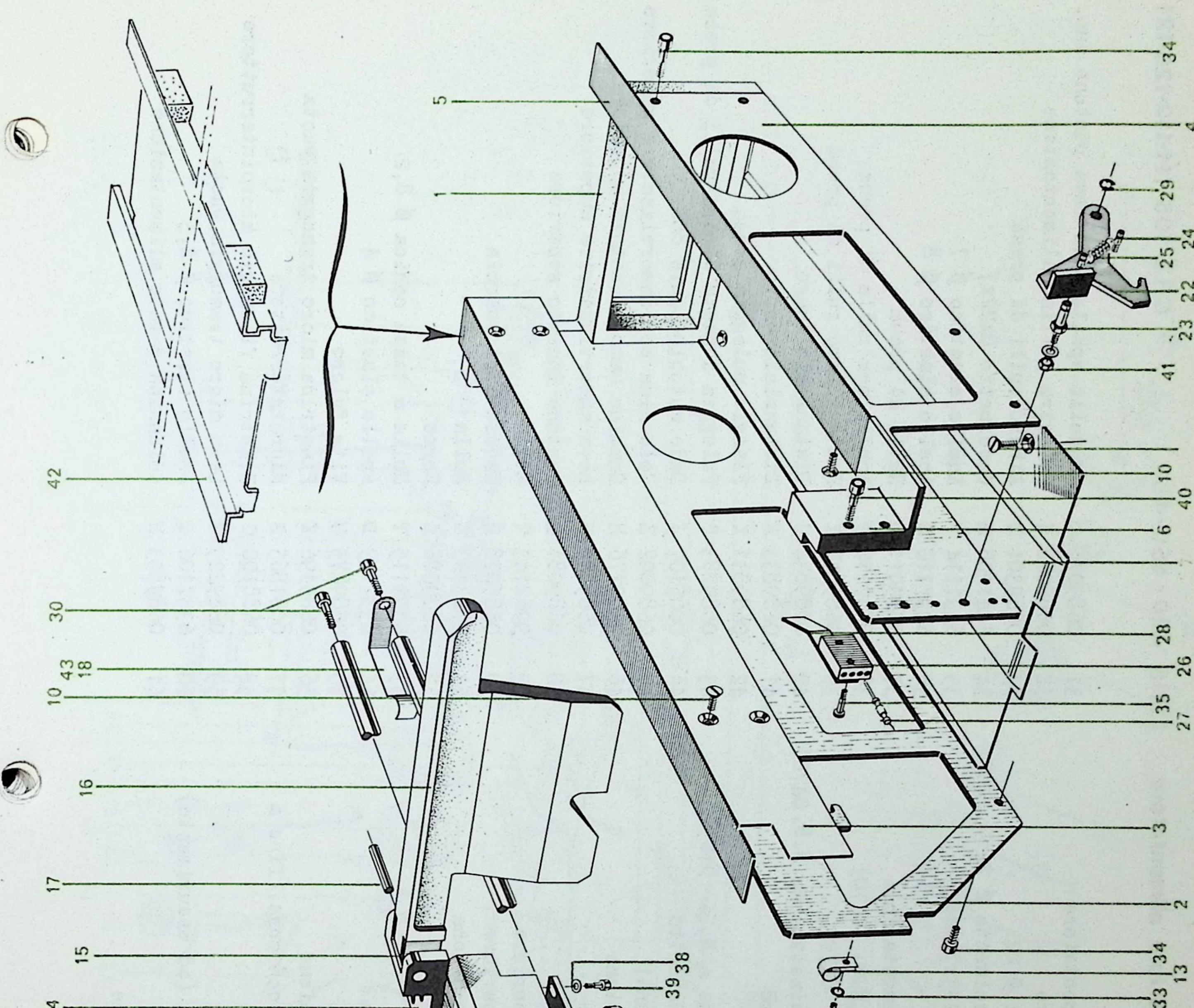
SOTTOSISTEMA CRZ-105-111-112-120-121





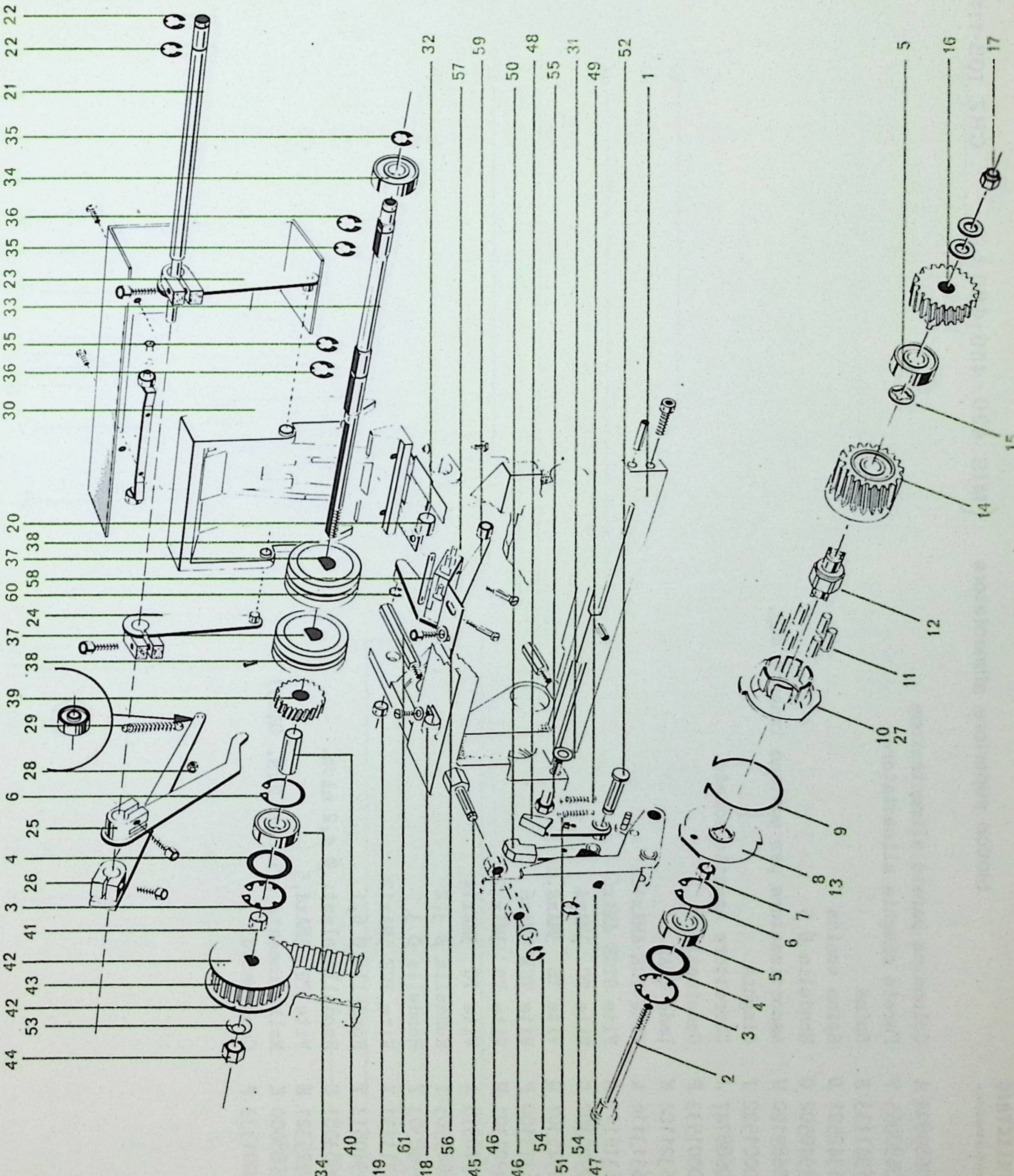
magazzino alimentazione (MIS 420-450-460) CRZ 105-111-112-120-121

1	0689273 E	Fusione di fondo alimentatore
2	0689097 W	Fianchetto sinistro
3	0689899 F	Parete sinistra tramoggia
4	0689098 K	Fianchetto destro
5	0689909 C	Parete destra caricatore
6	0689908 G	Blocchetto parete destra
7	0688741 H	Tramoggia caricatore
8	0689900 H	Supporto barre piattelli
9	0689901 A	Barra tramoggia alimentazione
10	6312744 D	Vite TS 4MAx10
11	0689189 F	Carrello completo per piattello
12	0689575 D	Collarino per barra
13	5618052 C	Serracavo Looping tipo 2
14	0689905 B	Cerniera piattello alimentazione
15	0689124 U	Squadretta per cerniera piattello
16	0689056 N	Piattello per alimentatore
17	6341162 Z	Spina cilindrica 7x32
18	0689902 N	Lamina agg.piattello (fino a N.S.0582)
19	0689583 V	Piastrina guida piattello " " "
20	0689584 J	Rullino guida piattello
21	6337107 L	Anello elastico ∅ 3,2
22	0689104 E	Gancio cassetto
23	0689917 G	Perno per gancio cassetto
24	0689121 X	Portamolla
25	9963183 B	Molla gancio cassetto
26	0005176 H	Connettore AMP
27	0000885 B	Pin maschio AMP
28	0689526 L	Piastrina per fissaggio connettore
29	6337109 D	Anello elastico ∅ 4
30	6313148 W	Vite TCE 6MAx15
31	9940618 R	Rondella ∅ 6,1
32	6313100 F	Vite TCE 3MAx6
33	0683505 Y	Rondella ∅ 3,2
34	6313131 X	Vite TCE 5MAx12
35	9920216 N	Vite TC 2,6MAx7,5
36	9920401 Y	Vite TC 4MAx5
37	6313116 A	Vite TCE 4MAx12
38	9940432 V	Rondella ∅ 4,2
39	6313115 W	Vite TCE 4MAx10
40	6313117 E	Vite TCE 4MAx15
41	6321206 G	Dado 6MA
42	0688788 K	Gruppo tramoggia (sk 51 col.)
43	0688069 G	Lamina agg.piattello (fino a N.S.0582)
44	0688075 C	Carrello " " "
45	0688072 K	Piastrina guida piattello " "
46	0688055 E	Perno cuscinetto " " "
47	0688054 A	Distanziale " " "
48	0001533 P	Cuscinetto " " "
49	0688053 M	Eccentrico carrelli " " "
50		Anello elastico " " "
51		Dado " " "
52	0688066 K	Barra tramoggia " " "

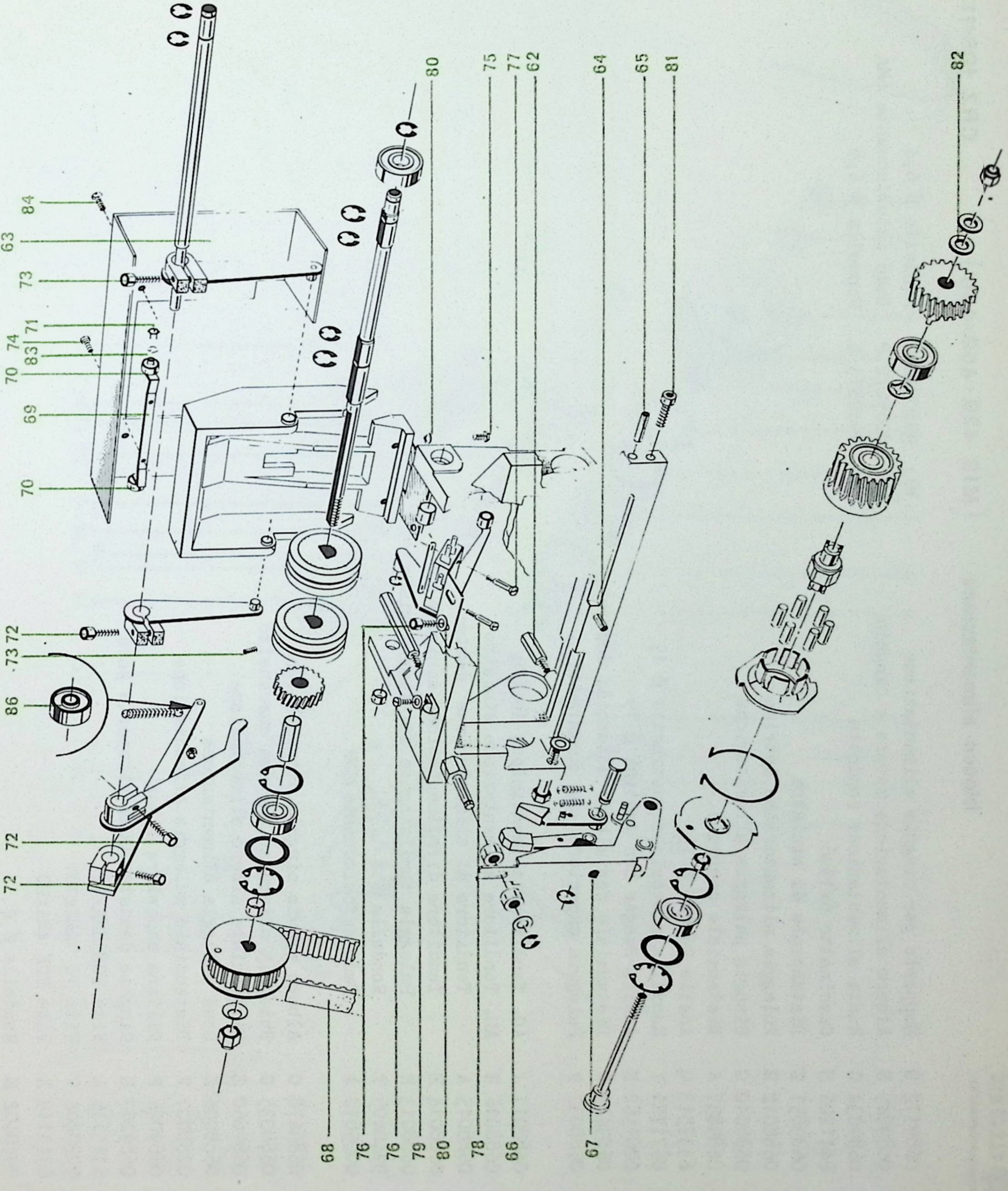


blocco superiore alimentatore (MIS 420-450-460) CRZ 105-111-112-120-121

1	0689288	D	Supporto superiore alimentatore
2	0689358	U	Albero innesto superiore
3	0001563	J	Anello Seeger a dentini ∅ 22
4	0671214	J	Rondella protezione cuscinetto ∅ 22
5	0001874	X	Cuscinetto ∅ 9,525x22,225x7,144
6	6337516	M	Anello Seeger ∅ 22
7	0689367	D	Distanziale innesto alimentazione
8	0688029	C	Camma contromarcia (da N.S. 0470)
9	0688023	J	Molla innesto (da N.S. 0470)
10	0688028	G	Gabbia innesto con cuscinetto (da N.S. 0470)
11	0001872	E	Rullini cilindrici ∅ 5x8
12	0689378	W	Corpo innesto
13	0689365	Y	Camma contromarcia (fino a N.S. 0469)
14	0689361	X	Campana innesto con cuscinetto
15	0689067	K	Distanziale giunto innesti
16	0689035	G	Ruota motrice alimentazione
17	0005072	P	Dado autobloccante 6MA
18	5618052	C	Serracavo Looping tipo 1
19	0689774	D	Boccola per fusione superiore
20	0671556	G	Boccola per fusione superiore
21	0689032	K	Albero piattello alimentazione
22	6337112	C	Anello elastico ∅ 6
23	0688059	F	Leva piattello destra
24	0688060	D	Leva piattello sinistra
25	0689298	E	Leva comando puntone
26	0688062	J	Leva camma di alimentazione
27	0689763	E	Gabbia innesto aliment.con cusc.(fino a N.S. 0469)
28	6320606	P	Dado autobloccante 4MA
29	0688758	G	Molla per leva di alim. (ad esaurimento)
	0688125	U	" " " " "
30	0688058	B	Pattino di alimentazione
31	0689076	Q	Rondella spallamento leva puntone sup.
32	0689062	N	Balestra pattino alimentazione
33	0689301	D	Albero rulli di presa
34	6441208	M	Cuscinetto 8x22x7
35	6337114	V	Anello elastico ∅ 7
36	6337116	D	Anello elastico ∅ 8
37	0689011	D	Rullo di presa
38	0689170	T	Anello per rullo di presa
39	0689835	Y	Ruota albero rulli di presa
40	0689834	U	Distanziale lungo
41	0689833	F	Distanziale corto
42	0689831	X	Flangia puleggia presa
43	0689283	P	Puleggia dentata albero rulli di presa
44	0005107	J	Dado autobloccante 8MA
45	0689092	Z	Colonnina per ammortizzatore superiore
46	0689176	H	Gommino ammortizzatore superiore
47	0689095	N	Leva ammortizzatrice superiore
48	0689081	L	Puntone innesto superiore
49	9962143	T	Molla
50	0689078	H	Gancio contromarcia
51	9963163	Z	Molla
52	0689086	Z	Perno
53	6351115	T	Molla a tazza conica ∅ 8,2
54	6337109	D	Anello elastico ∅ 4
55	0689875	U	Vite fulcro
56	0689196	K	Piastrina micro tramoggia vuota
57	0001865	S	Microinterruttore
58	0688100	C	Piastrina fissaggio microinterruttore
59	0689229	T	Leva micro tramoggia vuota
60	6337106	Q	Anello elastico ∅ 2,3
61	0689893	M	Colonnina parete alimentazione

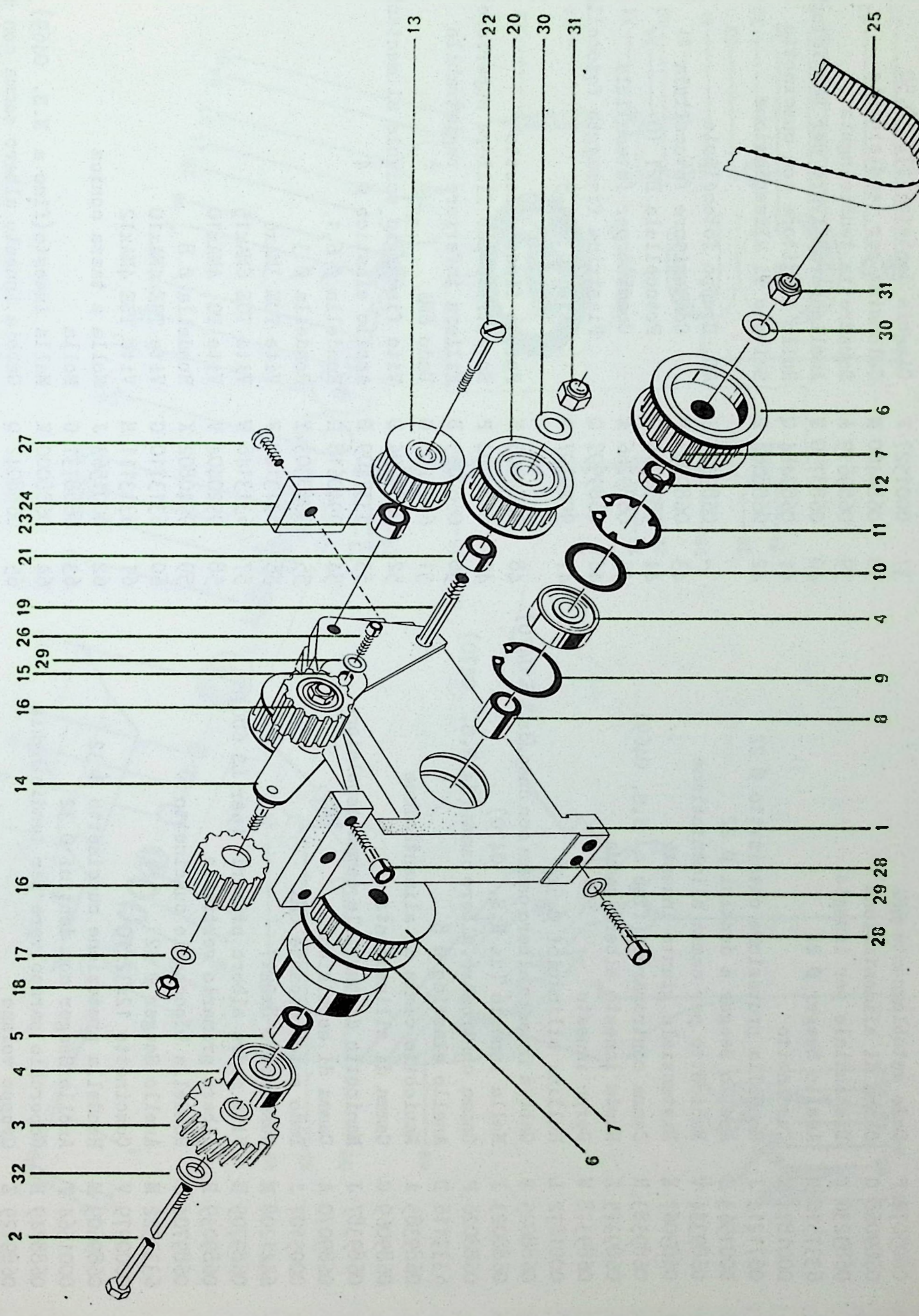


62	0689894 A	Colonnina parete alimentazione
63	0688065 F	Parete cinghie alimentatore
64	6341133 S	Spina
65	6342521 D	Spina conica
66	9940502 G	Rondella Ø 5
67	0689120 W	Ammortizzatore per puntone innesto sup.
68	0001522 J	Cinghia
69	0688747 J	Correttore assetto schede
70	0001533 P	Cuscinetto
71	6321104 W	Dado 4MA
72	6313116 A	Vite TCE 4MAx12
73	6316111 S	Vite STCE 4MAx6
74	9920302 S	Vite TC 3MAx4
75	9925301 Q	Vite TE 3MAx4,8
76	6313100 F	Vite TCE 3MAx6
77	9921301 P	Vite TS 3MAx12
78	9920315 A	Vite TC 3MAx14
79	0683505 Y	Rondella Ø 3,2
80	9940303 Y	Rondella Ø 3
81	6313131 X	Vite TCE 5MAx12
82	9940613 T	Rondella Ø 6,1
83	0683081 S	Rondella elast. Ø 4,2 nich.
84	9925321 E	Vite TS 3MAx4,5
85	0688000 K	Molla innesto (fino a N:S. 0469)
86	0001533 P	Cuscinetto



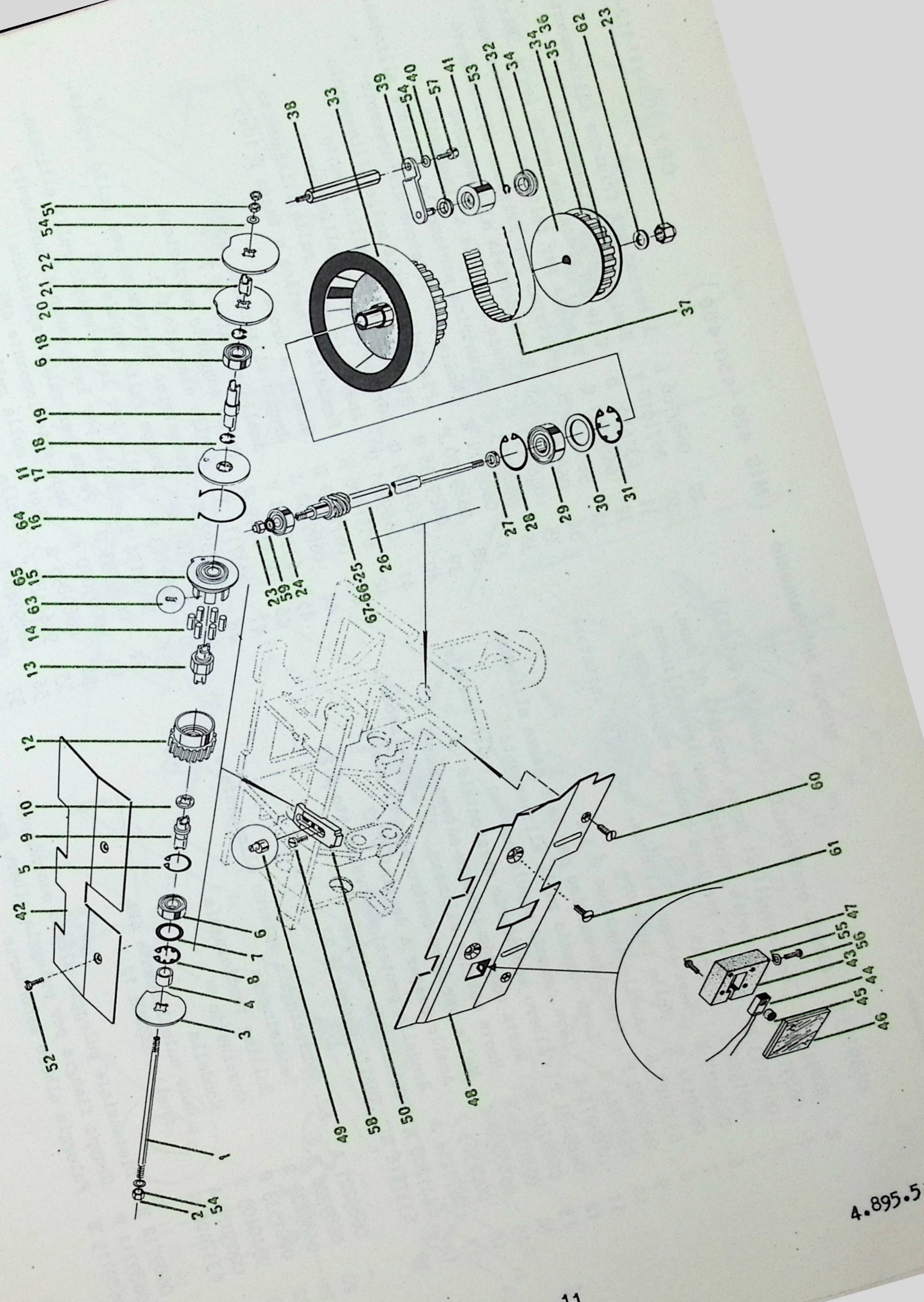
blocco alimentazione

1	0689172 G	Supporto per cinghie alimentazione
2	0689849 S	Albero alimentazione motore e cinghie
3	0689034 C	Ruota alimentazione condotta
4	6441206 U	Cuscinetto 6x19x6
5	0689851 Z	Distanziale di sinistra
6	0688012 M	Puleggia alimentazione motrice
7	0688010 G	Flangia puleggia alimentazione
8	0689857 A	Distanziale centrale
9	6337513 Q	Anello Seeger ∅ 19
10	0671721 Y	Rondella protezione cuscinetto ∅ 19
11	0001562 N	Anello Seeger con dentini ∅ 19
12	0689479 C	Distanziale per albero motore di destra
13	0688032 P	Puleggia superiore con cuscinetti
-	0688017 J	AG. Tenditore alimentazione destro
-	0688016 N	AG. Tenditore alimentazione sinistro
14	0688015 A	Tenditore di alimentazione destro
15	0688014 E	Tenditore di alimentazione sinistro
16	0688013 R	Puleggia tendicinghia di alimentazione
17	9940405 T	Rondella ∅ 4
18	0005070 A	Dado autobloccante 4MA
19	0689478 G	Albero rinvio cinghia alimentazione
20	0688035 C	Puleggia alimentazione con cuscinetto
21	0689860 Z	Distanziale albero alimentazione
22	0688006 Z	Stud puleggia alimentazione
23	0688007 V	Distanziale puleggia alimentazione
24	0689066 P	Filiera superiore fissa
25	0689267 E	Cinghia dentata 100xL ricoperta para
26	6313116 A	Vite TCE 4MAx12
27	9920404 V	Vite TC 4MAx10
28	6313119 X	Vite TCE 4MAx20
29	9940402 E	Rondella ∅ 4
30	9940618 R	Rondella ∅ 6,4
31	0005072 P	Dado autobloccante 6MA
32	9940673 Z	Rondella ∅ 6,8



gruppo albero verticale e albero a camme (MIS 420-450-460) CRZ 105-111-112-120-121

1	0689389 B	Albero camme
2	0005072 P	Dado autobloccante 6MA
3	0689068 G	Camma di alimentazione
4	0689236 F	Distanziale per innesto
5	6337516 M	Anello Seeger ∅ 22
6	0001874 X	Cuscinetto
7	0671214 J	Rondella protezione cuscinetto ∅ 22
8	0001563 J	Anello Seeger a dentini ∅ 22
9	0689374 V	Manicotto per camma alimentazione
10	0689067 K	Distanziale giunto innesti
11	0689383 R	Camma contromarcia(fino a N.S. 0469)
12	0689375 Z	Ruota innesto albero camme
13	0689378 W	Corpo innesto
14	0001872 L	Rullini cilindrici ∅ 5x8
15	0688025 B	Gabbia innesto albero camma con cusc.(da N.S. 0470)
16	0688023 J	Molla innesto (da N.S. 0470)
17	0688026 P	Camma contromarc.albero camma (da N.S. 0470)
18	6337116 D	Anello elastico ∅ 8
19	0689385 A	Manicotto camma di alimentazione
20	0689069 C	Camma di allineamento
21	0689387 J	Manicotto distanziale camma espulsione
22	0689070 A	Camma di espulsione
23	0005107 J	Dado autobloccante 8MA
24	6441208 M	Cuscinetto 8x22x7
25	0689705 N	Vite madre albero primario (per LS 600)
26	0689039 H	Albero primario verticale
27	0689704 J	Rondella bloccaggio cuscinetto
28	6337522 M	Anello Seeger ∅ 32
29	0000979 V	Cuscinetto 12x32x10
30	0689609 M	Rondella protezione cuscinetto ∅ 32
31	0001564 F	Anello Seeger con dentini ∅ 32
32	0688749 B	Coperchio parapolvere per tendicinghia
33	0689129 Z	Gruppo volano
34	0689292 L	Flangia per puleggia motrice
35	0689306 J	Ruota motrice albero primario 50 Hz
36	0689279 Y	Ruota motrice albero primario 60 Hz
37	0001527 P	Cinghia dentata 187L 0,50
38	0689400 N	Colonnina per tendicinghia
39	0689619 A	Squadretta tendicinghia
40	0688750 N	Anello parapolvere per tendicinghia
41	0689484 Q	Rullo tenditore con cuscinetto
42	0688064 B	Scivolo di alimentazione
-	0689347 E	AG. Gruppo fotocellule
43	0689993 P	Contenitore fotocellula
44	5854215 G	Fotocellula BPY 10
45	0689266 A	Gommino per fotocellula
46	0689997 Q	Piastrina fissaggio fotocellula
47	9920107 T	Vite TC 2x4,5
48	0689305 E	Parete fissa cassetto
49	0689794 P	Eccentrico per filiera superiore
50	0689065 B	Filiera inferiore registrabile
51	6321206 G	Dado 6MA
52	0689294 D	Vite fissaggio scivolo alimentazione
53	6337109 D	Anello elastico ∅ 4
54	9940618 R	Rondella ∅ 6,1
55	9940303 Y	Rondella ∅ 3
56	6313100 F	Vite TCE 3MAx6
57	6313148 W	Vite TCE 6MAx15
58	9920404 V	Vite TC 4MAx10
59	9940802 X	Rondella ∅ 8
60	6313710 G	Vite TSE 4MAx10
61	6313111 H	Vite TSE 4MAx12
62	0001563 J	Molla a tazza conica
63	0688731 G	Molla
64	0688000 K	Molla innesto(fino a N.S. 0469)
65	0688042 Q	Gabbia innesto albero camma con cusc. (fino a N.S. 0469)
66	0688086 V	Vite madre (per LS 400)
67	0688135 U	Vite madre (per LS 350)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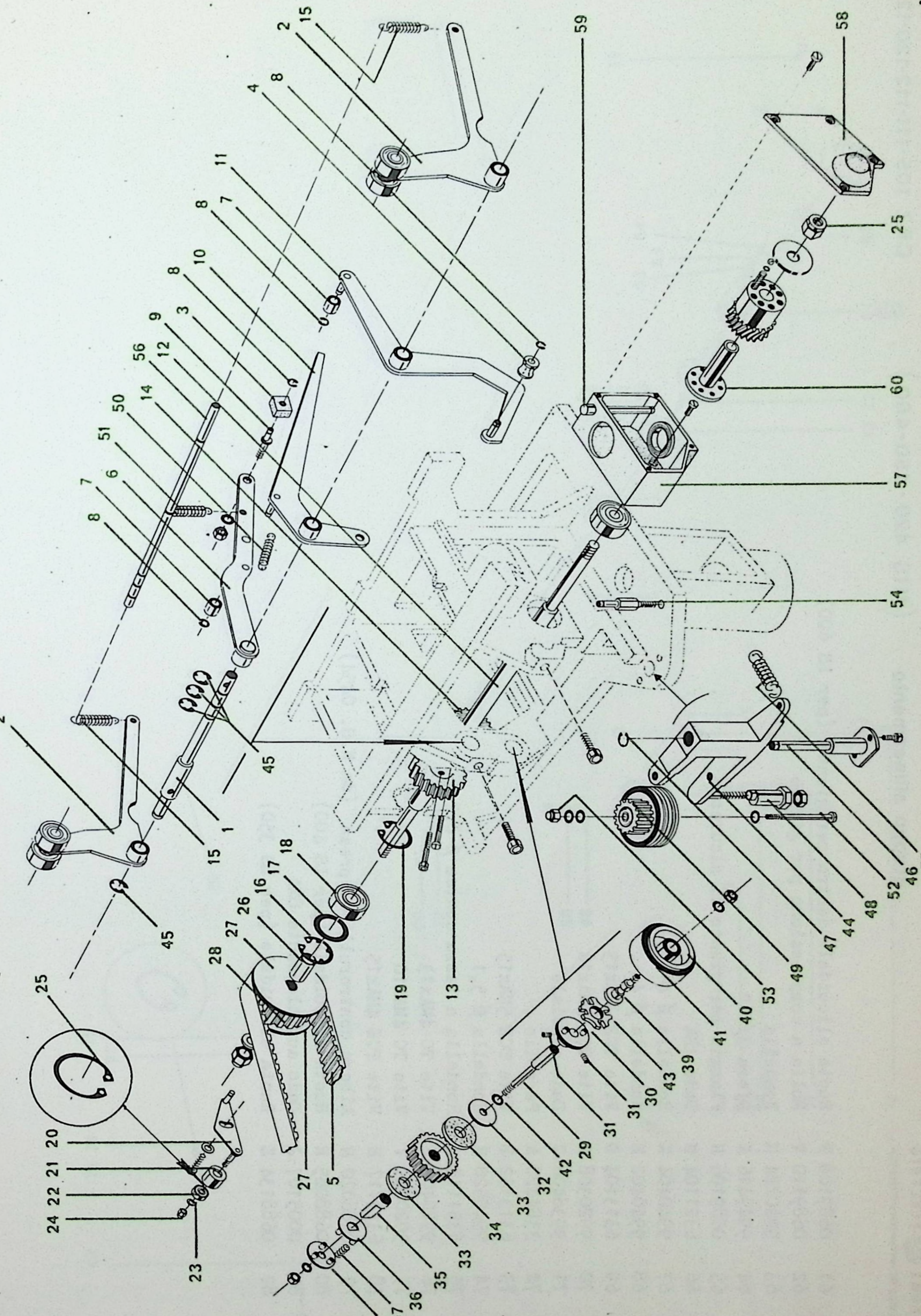
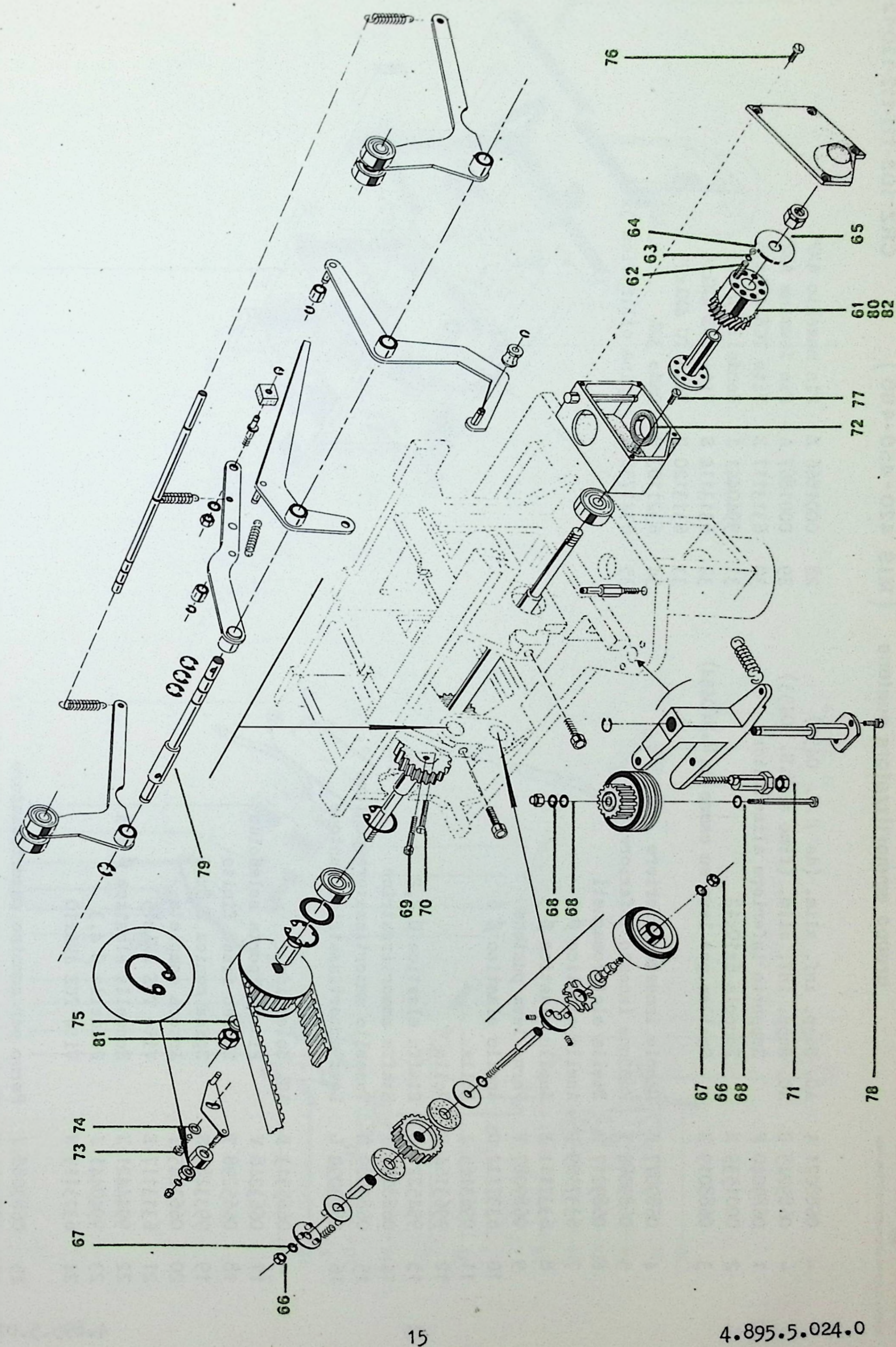
gruppo allineamento (MIS 420-450-460) CRZ 105-111-112-120-121

1	0689733	L	Albero controrulli (fino a N.S.0453)
2	0689481	K	Controrulli di presa completo di cusc.
3	0689115	X	Blocchetto regolaz. per leva allineam.
4	0689113	E	Rullino per leva comando espulsione
5	0001522	J	Cinghia
6	0689017	N	Leva camma allineam. con rullo tastatore
7	0689114	T	Rullo tastatore
8	6337107	L	Anello elastico Ø 3,2
9	0689072	P	Perno eccentrico per leva camma allineam.
10	0689744	A	Leva comando rulli allineamento
11	0689073	K	Leva comando espulsione con rullo tastat.
12	0689483	T	Albero secondario orizzontale
13	0688744	E	Ruota comando innesto albero camme
14	0688743	R	Ruota motrice allineam. su albero second.
15	0688050	C	Molla per leva controrullo di presa
16	0001563	J	Anello seeger a dentini Ø 22
17	0671214	J	Rondella protezione cuscinetto Ø 22
18	6441208	M	Cuscinetto 8x22x7
19	6337516	M	Anello seeger Ø 22
-	0689227	A	AG. Tendicinghia esterno alimentatore
20	0689226	E	Tendicinghia
21	0689225	S	Rullino tendicinghia
22	0001533	P	Cuscinetto
23	9940405	T	Rondella
24	0005070	A	Dado autobloccante 4MA
25	6337406	W	Anello SEEGER 12,7
26	0689712	N	Distanziale puleggia albero secondario
27	0689714	F	Gruppo flangia per puleggia albero second.
28	0689715	B	Puleggia albero secondario
29	0689766	L	Alberino per frizione allineamento
30	0671018	Y	Semigiunto allineamento
31	6316101	D	Vite di pressione senza testa 3MAx5
32	0689767	Q	Flangia per feltrini di allineamento
33	9602125	H	Feltrini per frizione allineamento
34	0689286	L	Ruota dentata allineamento
35	0689771	G	Mozzo frizione allineamento
36	0689773	Q	Piastrina portamolla frizione allineam.
37	0689179	W	Molla per frizione allineamento
38	0689770	F	Piastrina guida molle allineamento
39	0689338	S	Stud per rullo allineamento
40	0689765	G	Gruppo rullo di allineamento
41	0689251	U	Anello in gomma rullo allineamento
42	6351106	H	Rondella elastica a tazza Ø 10x5
43	0671089	B	Giunto a croce
44	0689752	J	Gruppo bilanciere
45	6337114	V	Anello elastico Ø 7
46	0689749	F	Perno supporto espulsione
47	6337111	Y	Anello elastico Ø 5
48	0689397	K	Eccentrico di regolazione rullo espuls.
49	0689167	C	Gruppo rullo espulsione
50	9963183	B	Molla per leva comando rulli allineam.
51	9962154	R	Molla per leva camma allineamento
52	0689753	N	Perno per rullo espulsione
53	0005070	A	Dado autobloccante 4MA
54	0689895	E	Porta molla rullo espulsione
55	9960181	J	Molla
56	0689748	B	Alberino per molle
57	0689012	R	Scatola per lubrificazione ridutt.veloc.
58	0689015	E	Coperchio per scatola riduttore velocità
59	0689016	J	Asta per controllo livello olio
60	0689107	J	Manicotto per giunto di sicurezza a sfere

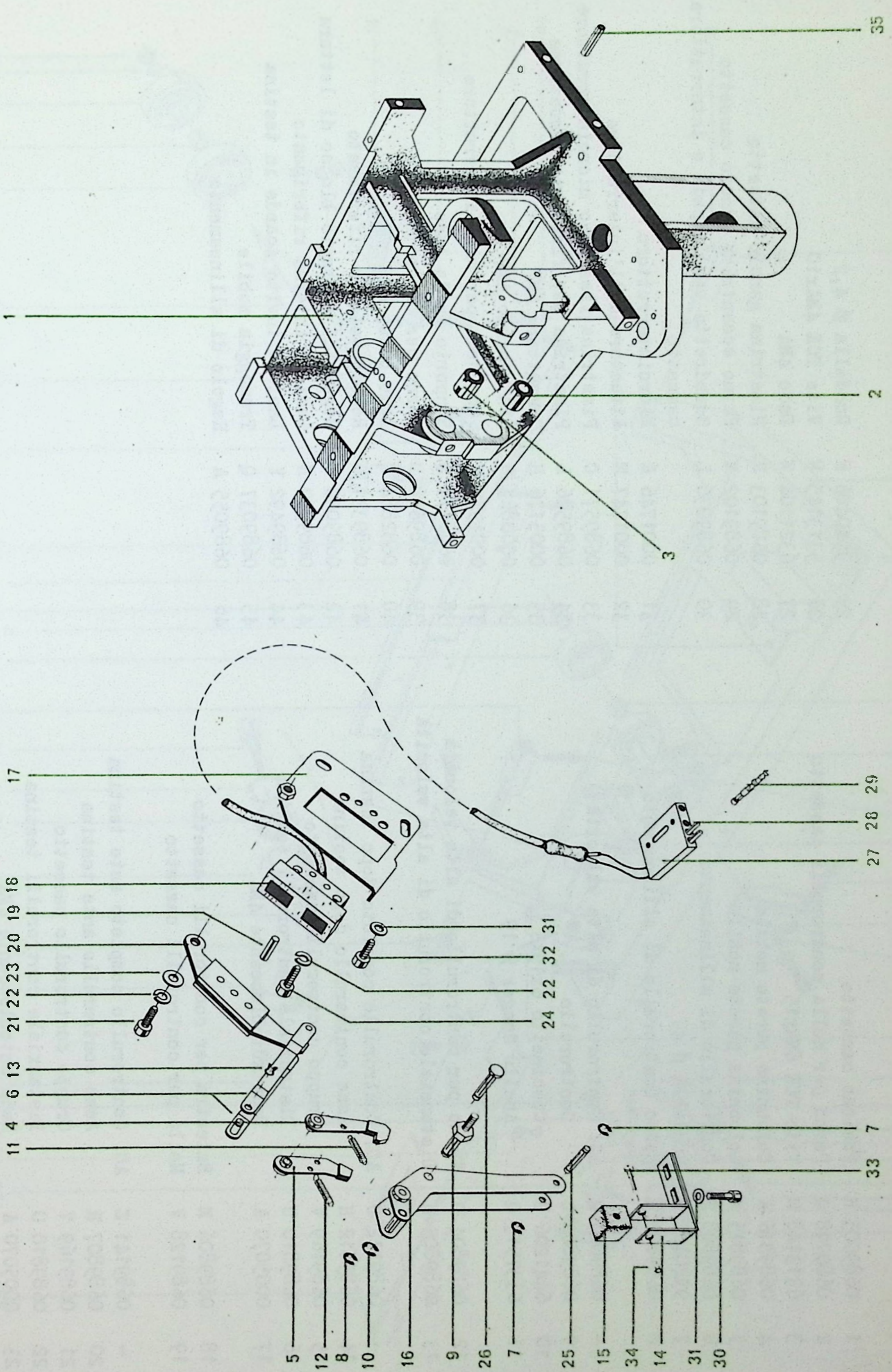


61	0689108 F	Ruota elicoidale destra per giunto (per LS 600)
62	0689110 V	Molla a compressione per giunto
63	9940224 M	Rondella
64	9949416 X	Sfera 3/16"
65	0689106 N	Flangia per giunto di sicurezza
66	6321104 W	Dado 4MA
67	9940404 X	Rondella Ø 4
68	9940402 E	Rondella Ø 4
69	6313104 D	Vite TCE 3MAx15
70	9920308 L	Vite TC 3MAx16
71	9938406 C	Dado speciale
72	3384420 A	Paraolio
73	6313132 B	Vite TCE 5MAx15
74	9940520 R	Rondella Ø 5,1
75	6351115 J	Rondella a tazza conica Ø 8,2
76	9920403 G	Vite TC 4MAx13
77	9920404 V	Vite TC 4MAx10
78	6313117 E	Vite TCE 4MAx15
79	0688020 H	Albero controrulli di presa (da N.S. 0454)
80	0688085 R	Ruota elicoidale (per LS 400)
81	0005107 J	Dado autobloccante 8MA
82	0688134 Z	Ruota elicoidale (per LS 350)

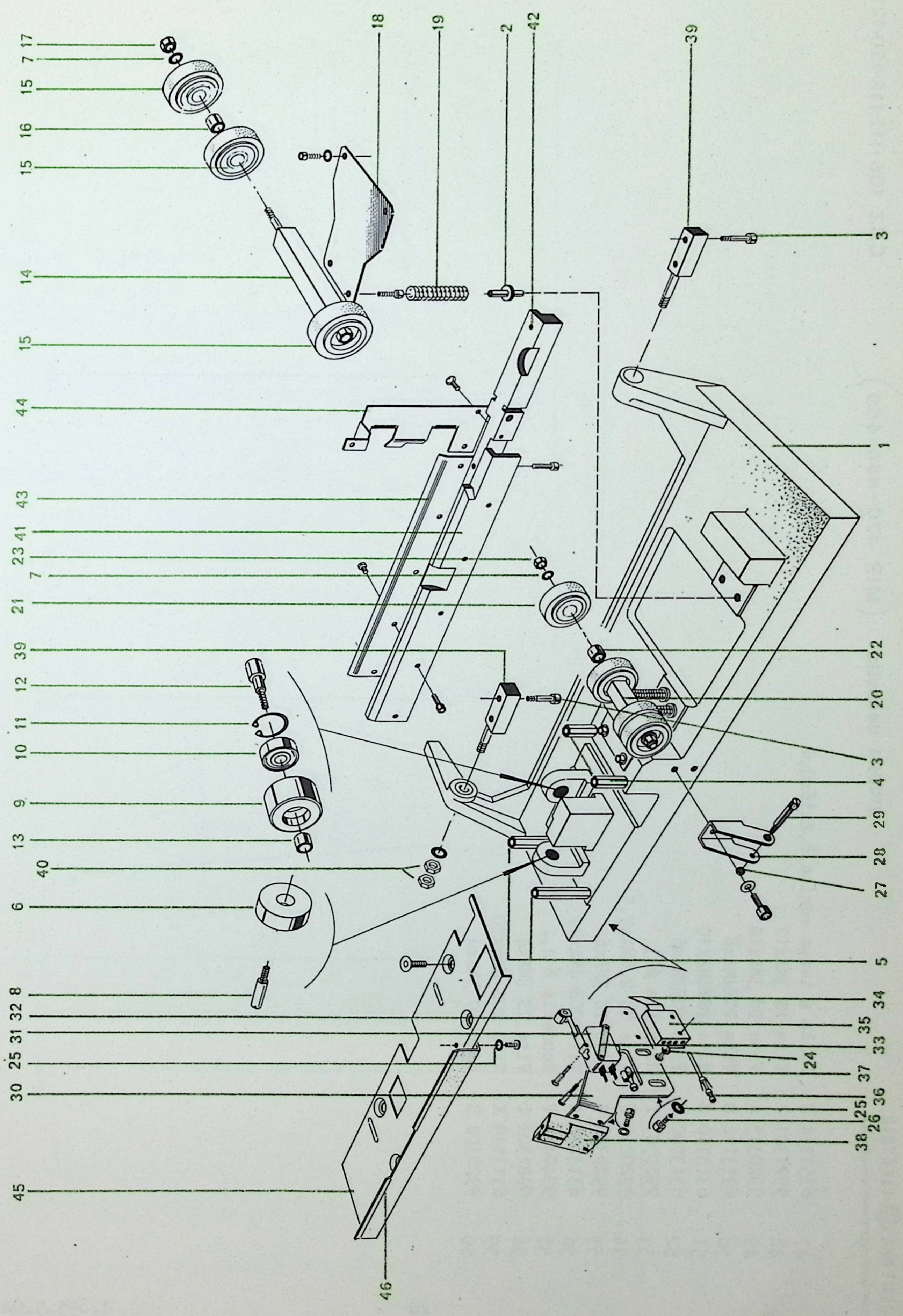


gruppo ammortizzatore puntone (MIS 420-450-460)

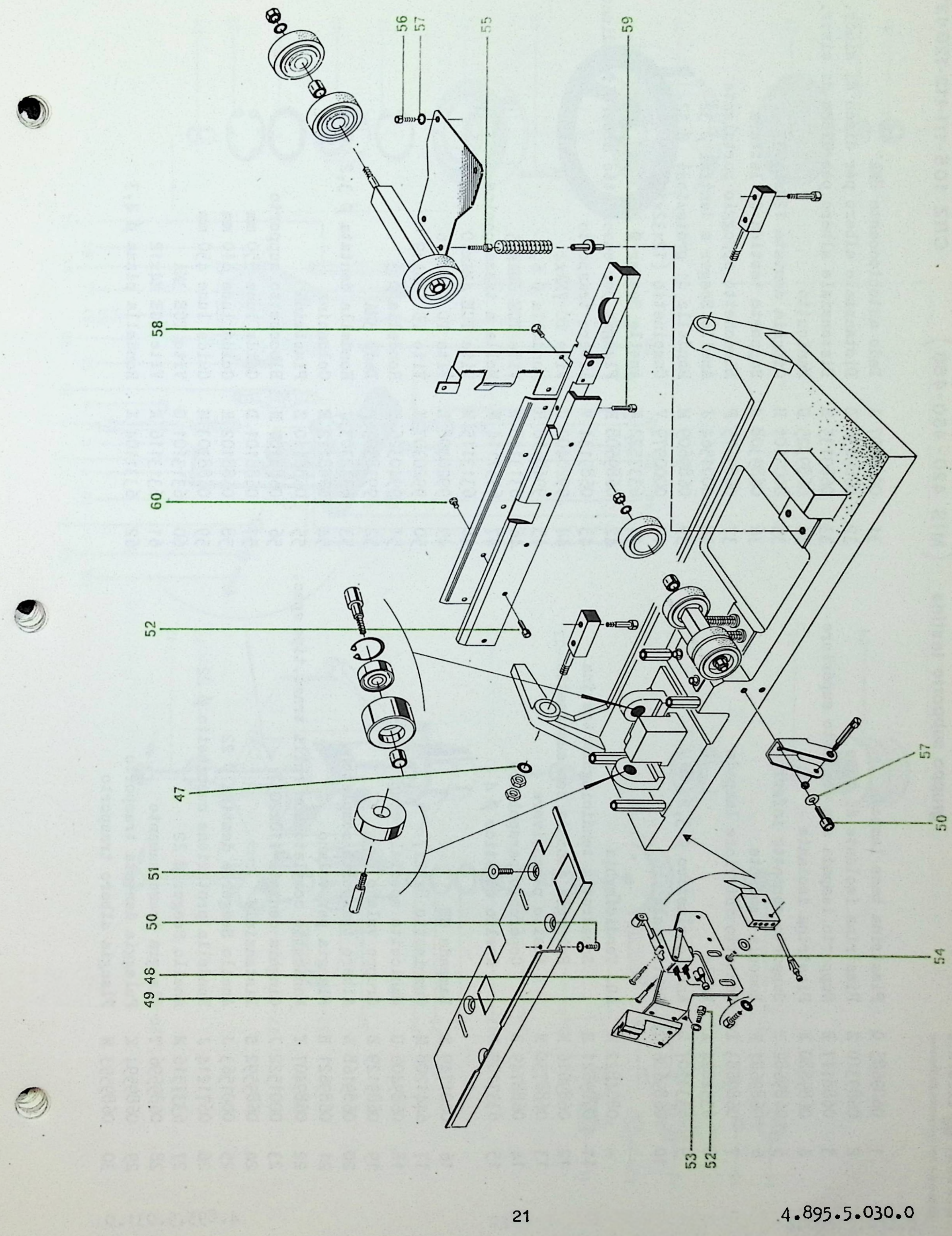
-	0688021	A	AG. Supp. inf. alim. (da N.S. 0454)
-	0689245	U	AG. Supp. inf. alim. (fino a N.S. 0453)
1	0689040	F	Supporto inferiore alimentatore
2	0001539	H	Boccola 6x10x12
3	0688019	B	Spallam.per leve su camme (da N.S.0454)
4	0689077	L	Gancio innesto inferiore
5	0689082	Y	Puntone innesto inferiore
6	0689217	H	Biella elettromagneti
7	6337109	D	Anello elastico ∅ 4
8	6337111	Y	Anello elastico ∅ 5
9	0689087	V	Perno leva puntone
10	6337112	C	Anello elastico ∅ 6
11	9963165	J	Molla
12	9963164	N	Molla
13	9945221	E	Staffa elastica ∅ 2,2
14	0688092	J	Staffa ammortizzatrice
15	0689089	M	Tassello ammortizzatore puntone
16	0689090	L	Leva ammortizzatrice puntone
-	0665513	B	AG. Solenoide
17	0663248	V	Piastra porta solenoide
18	0665298	T	Nucleo fisso finito
19	9933281	S	Spina conica 2,8x10
20	0663245	Y	Ancora completa
21	6313117	E	Vite TCE 4MAx15
22	9944421	N	Rondella elastica ∅ 4,3
23	9940441	J	Rondella ∅ 4,3
24	6313115	W	Vite TCE 4MAx10
25	0689088	J	Perno per gommino ammortizzatore
26	0689086	Z	Perno per puntoni
27	0005176	H	Connettore AMP 4 contatti
28	0001866	E	Pin maschio AMP
29	0001867	A	Pin femmina AMP
30	6313117	E	Vite TCE 4MAx15
31	9940441	J	Rondella ∅ 4,3
32	6313114	S	Vite TCE 4MAx8
33	6313120	V	Vite TC 4MAx25
34	6321103	H	Dado 3MA
35	6341732	A	Spina cilindrica 5x14



1	0689005 R	Fusione cassetto
2	0689798 Q	Perno per molla controrulli cassetto
3	6313148 W	Vite TCE 6MAx15
4	0689816 A	Colonnina parete mobile
5	0689815 W	Colonnina parete mobile
6	0689800 F	Controrullo di allineamento
7	9940402 E	Rondella ∅ 4
8	0689801 G	Perno controrullo di allineamento
-	0689803 Q	AG. Controrullo di alta velocità
9	0689802 L	Controrullo
10	6441206 U	Cuscinetto 6x19x6
11	6337513 Q	Anello Seeger ∅ 19
12	0689804 D	Perno per controrullo di alta velocità
13	0689805 H	Distanziale controrullo di alta velocità
-	0689142 D	AG. Controrullo completo dopo testina
14	0689812 H	Asse controrullo dopo testina
15	0689169 V	Gruppo controrullo cassetto
16	0689810 U	Distanziale controrulli testina
17	0005070 A	Dado autobloccante 4MA
18	0689806 M	Balestra per controrulli cassetto
19	0689128 V	Molla per controrulli cassetto
-	0689141 Z	AG. Controrullo completo ante testina
20	0689807 R	Asse controrullo ante testina
21	0689169 V	Gruppo controrullo cassetto
22	0689810 U	Distanziale controrulli testina
23	0005070 A	Dado autobloccante 4MA
24	9940250 E	Rondella ∅ 2,6
25	9940406 F	Rondella ∅ 4,2
26	5313115 W	Vite TCE 4MAx10
27	6321104 W	Dado 4MA
28	0689103 R	Piastrina gancio cassetto
29	0689102 M	Perno eccentrico gancio cassetto
30	0689036 L	Squadretta per lampada e interruttore cassetto
31	0001746 R	Microinterruttore
32	0001747 M	Attuatore dell'interruttore
33	0689571 C	Piastrina fissaggio microinterruttore
34	0689526 L	Piastrina per fissaggio connettore
35	0005176 H	Connettore AMP
36	0000885 B	Pin maschio AMP
37	0001979 W	Capocorda per microinterruttore
38	0688111 S	Supporto guida luce
39	0689698 D	Perno per cassetto
40	0682884 K	Dado basso 8MB
41	0689331 U	Regolo esterno riferimento
42	0689050 G	Regolo di appoggio blocco di lettura
43	0689999 H	Lamiera interna riferimento
44	0689492 Y	Lamiera invito schede in testina
45	0689037 Q	Tramoggia mobile
46	0689055 A	Regolo di allineamento

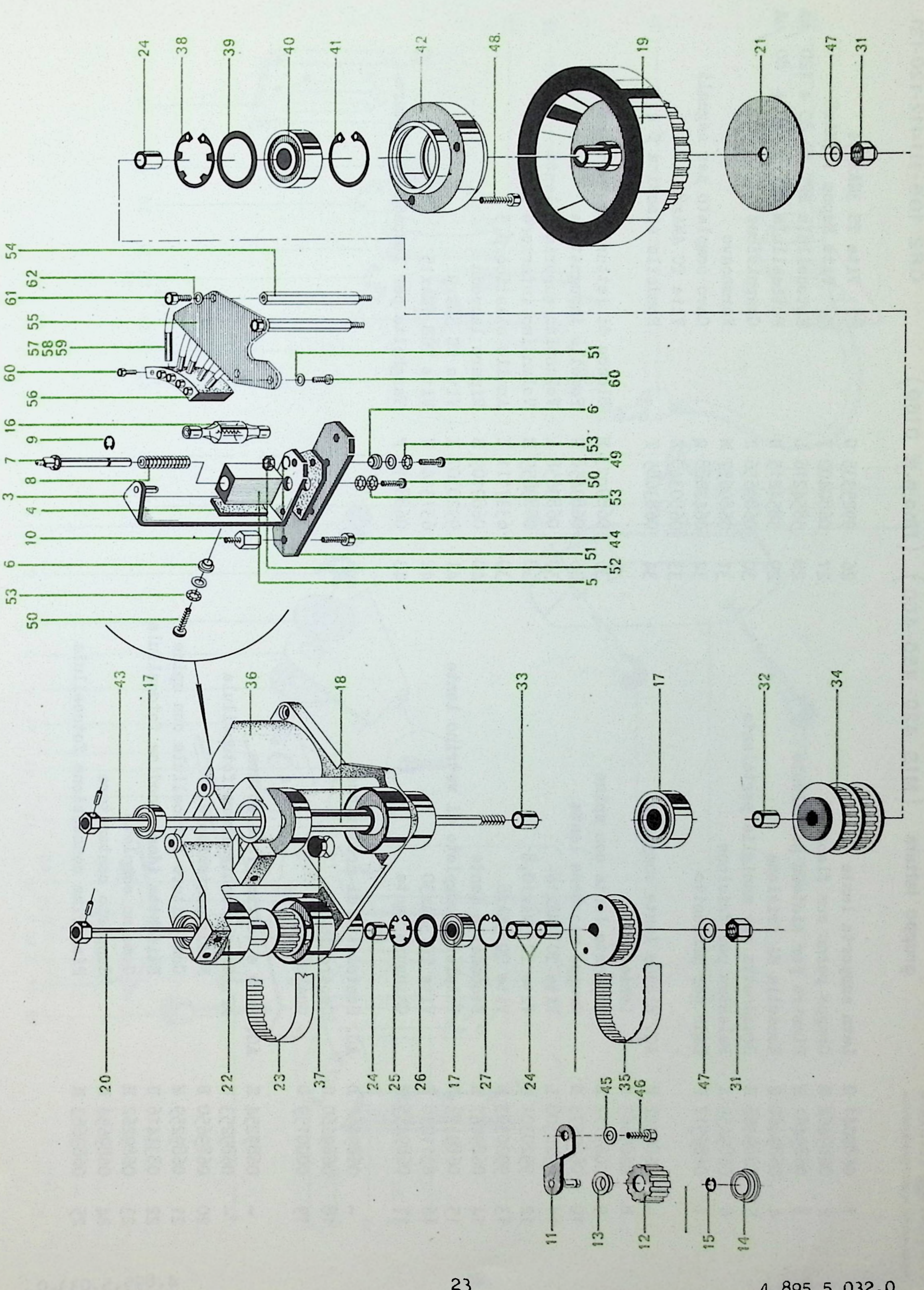


47	6351114 N	Molla a tazza conica 8,2x16x0,6
48	9921301 P	Vite TS 3MAx12
49	9920315 A	Vite TC 3MAx14
50	6313114 S	Vite TCE4MAx8
51	6313710 G	Vite TSE4MAx10
52	6313100 F	Vite TCE3MAx6
53	9940303 Y	Rondella ∅ 3
54	9920216 N	Vite TC 2,6MAx7,5
55	9920303 W	Vite TC 3MAx6
56	6313116 A	Vite TCE 4MAx12
57	9940432 V	Rondella ∅ 4,2
58	9921302 T	Vite TS 3MAx4
59	6313119 X	Vite TCE 4MAx20
60	9920302 S	Vite TC 3MAx4



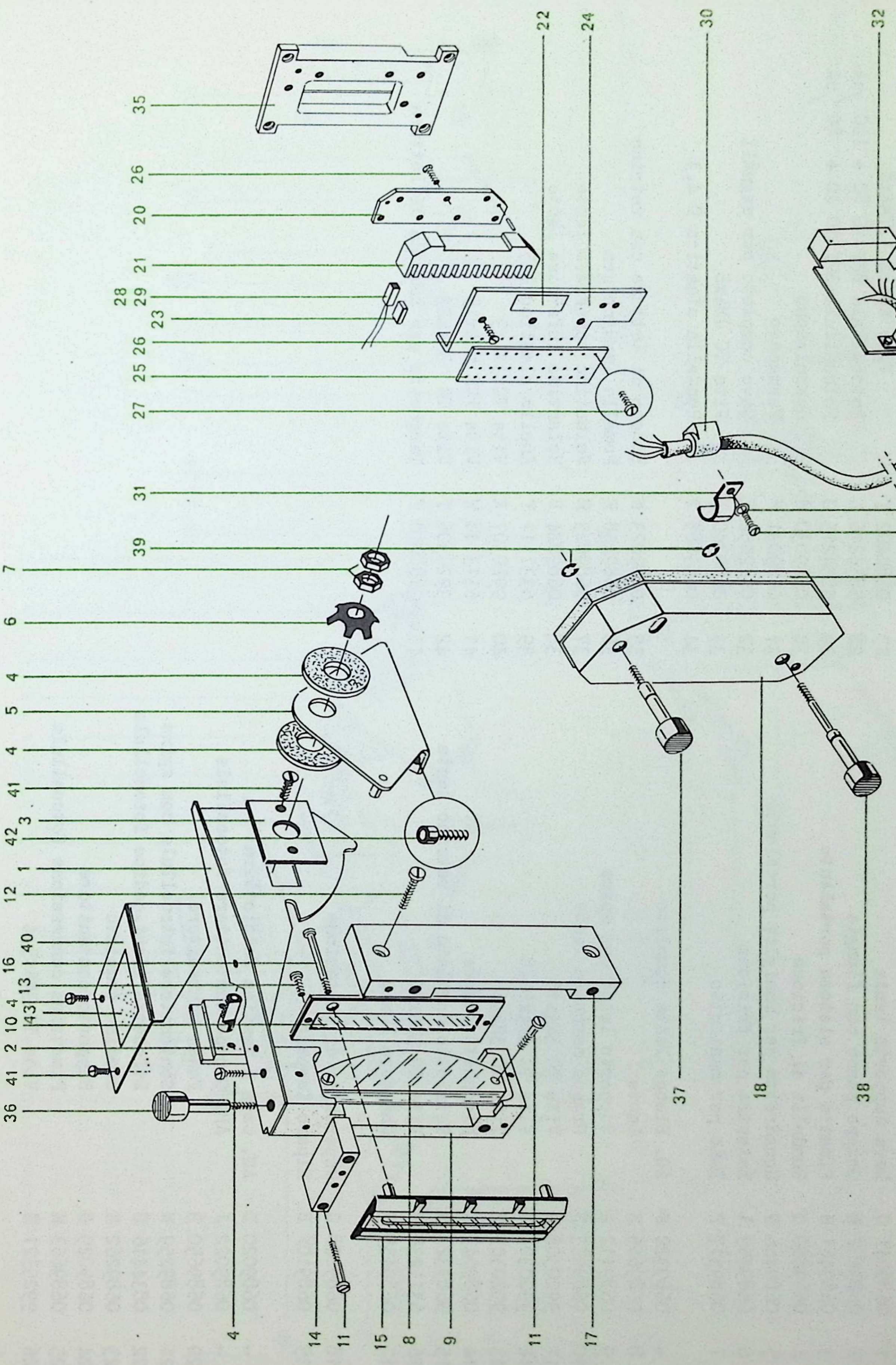
gruppo supporto testina (MIS 420-450-460) CRZ 105-111-112-120-121

1	0689685 Q	Piastrina base lampada
2	0689310 Z	Piastrina isolante di base
3	0688117 B	Supporto lampada con contatto superiore
4	0689680 N	Piastrina isolante
5	0689682 T	Supporto contatto inferiore
6	0689681 P	Boccola isolante
7	0689683 X	Contatto inferiore lampada
8	6352024 A	Molla
9	6337107 L	Anello elastico Ø 3,2
10	0689686 U	Distanziale
-	0804822 W	AG. Tendicinghia
11	0689621 H	Squadretta tendicinghia testina
12	0689616 M	Puleggia dentata con cuscinetto
13	0688750 N	Anello parapolvere
14	0688749 B	Coperchio parapolvere
15	6337109 D	Anello elastico Ø 4
16	0001749 E	Lampada GE
17	6441208 M	Cuscinetto 8x22x7
18	0689406 U	Manicotto speciale completo
19	0689129 Z	Gruppo volano
20	0689168 Z	Albero trasporto completo
21	0689621 H	Flangia per volano
22	0689407 Y	Manicotto completo con rulli trasc.tipo spec.
23	0001522 J	Cinghia dentata 110x2037
24	0689592 S	Distanziale
25	0001563 J	Anello Seeger a dentini Ø 22
26	0671214 J	Rondella protezione cuscinetto Ø 22
27	6337516 M	Anello Seeger Ø 22
28	0689596 T	Flangia trascinamento
29	0689594 K	Puleggia dentata trasporto
30	0689593 W	Flangia albero trasporto
31	0005107 J	Dado autobloccante 8MA
32	0689136 D	Distanziale albero per disco di sincr.
33	0689135 Z	Distanziale albero per disco di sincr.
34	0689325 U	Manicotto
35	0005101 H	Cinghia dentata 120xL,037
36	0689308 B	Supporto testina di lettura
37	0689675 F	Blocchetto appoggio portalente
38	0001564 J	Anello Seeger a dentini Ø 32
39	0689609 M	Rondella di protezione Ø 32
40	0000979 V	Cuscinetto (12x32x10)
41	6337522 M	Anello Seeger Ø 32
42	0689608 R	Flangia per cuscinetto albero fotodisco
43	0689134 V	Albero trasporto
44	9920402 C	Vite TC 7MAx4
45	9940618 R	Rondella Ø 6,1
46	6313148 W	Vite TCE 6MAx15
47	6351114 N	Molla a tazza conica
48	6313115 W	Vite TCE 4MAx10
49	9920408 L	Vite TC 3MAx16
50	9920307 X	Vite TC 3MAx9
51	9940326 T	Rondella Ø 3
52	9938305 P	Dado 3MA
53	6332303 J	Rondella dentata Ø 3,2
54	0688112 E	Colonnina
55	0688110 Z	Piastrina
56	0688107 N	Blocchetto supporto
57	0688101 D	Guida luce 950 mm
58	0688102 R	Guida luce 610 mm
59	0688103 M	Guida luce 450 mm
60	6313101 G	Vite TCE 3MA
61	6313116 A	Vite TCE M4x12
62	6331104 X	Rondella piana Ø 4,3



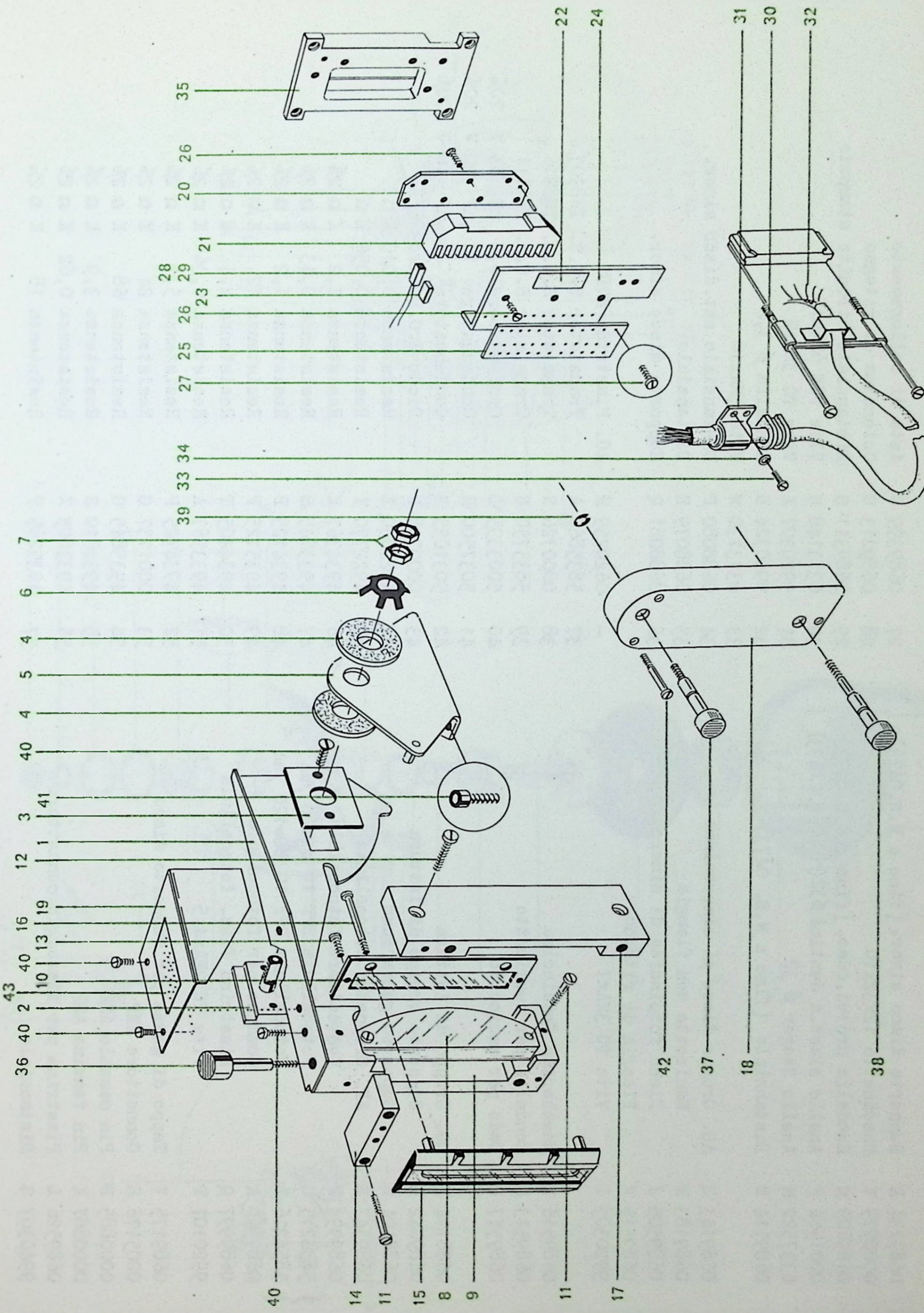
gruppo lettura (MIS 420-450-460) (fino n.s. 0160) CRZ 105-111-112-120-121

1	0689041 G	Leva supporto lente
2	0689462 M	Gruppo perno con flangia
3	0689461 H	Piastra per sistema portalente
4	0689460 G	Rondella di frizione
5	0689466 N	Squadretta per maniglia portalente
6	0689459 A	Balestra per frizione
7	0689517 P	Dado per manicotto
-	0689322 F	AG. Blocco lente completo
8	0689665 E	Lente
9	0689112 A	Supporto lente con spine
10	0689673 N	Gruppo maschera lente
11	9920308 L	Vite TC 3MAx16
12	9920301 N	Vite TC 3MAx10,8
13	9920303 W	Vite TC 3MAx6
14	0689047 R	Blocchetto lente
15	0689323 B	Telaietto completo di vetrino lente
16	6311238 P	Vite TC 3MAx30
17	0689455 H	Chiusura lente
-	0689661 D	AG. Scatolotto di protezione
18	0689660 C	Coperchio
19	0000159 D	Guarnizione
-	0689254 Z	AG. Cavo e testina fotolettura
-	0689253 C	AP. Gruppo contenitore fotocellula
20	0689650 B	Fondo contenitore
21	0689259 W	Contenitore fotocellule con spine
22	0834416 U	Etichetta ident. codice fotocellula
23	0689262 H	Gommino completo
24	0689654 H	Supporto contenitore
25	0689663 M	Piastrina connessione fotocellula
26	9925335 G	Vite TS 3MAx5,4
27	0680402 Y	Vite Rocca 1,7MAx8
28	5854216 L	Fotocellula BPY 10 80 ÷ 120 μA
29	5854215 G	Fotocellula BPY 10 40 ÷ 80 μA
30	0689656 R	Guarnizione
31	0689657 M	Fermacavo
32	0642088 Q	Cavo completo per segnali
33	0680340 Z	Vite TC 4MAx8
34	0683685 T	Rondella elastica Ø 4,3
35	0689023 N	Blocco di lettura con vetrino
36	0689458 E	Pomello impugnatura
37	0689658 A	Volantino superiore lente
38	0689659 E	Volantino inferiore lente
39	6337111 Y	Anello elastico Ø 5
40	0689109 B	Riparo lampada
41	9920307 X	Vite TC 3MAx9
42	6313148 W	Vite TCE 6MAx15
43	0688018 F	Targhetta per lampada di lettura



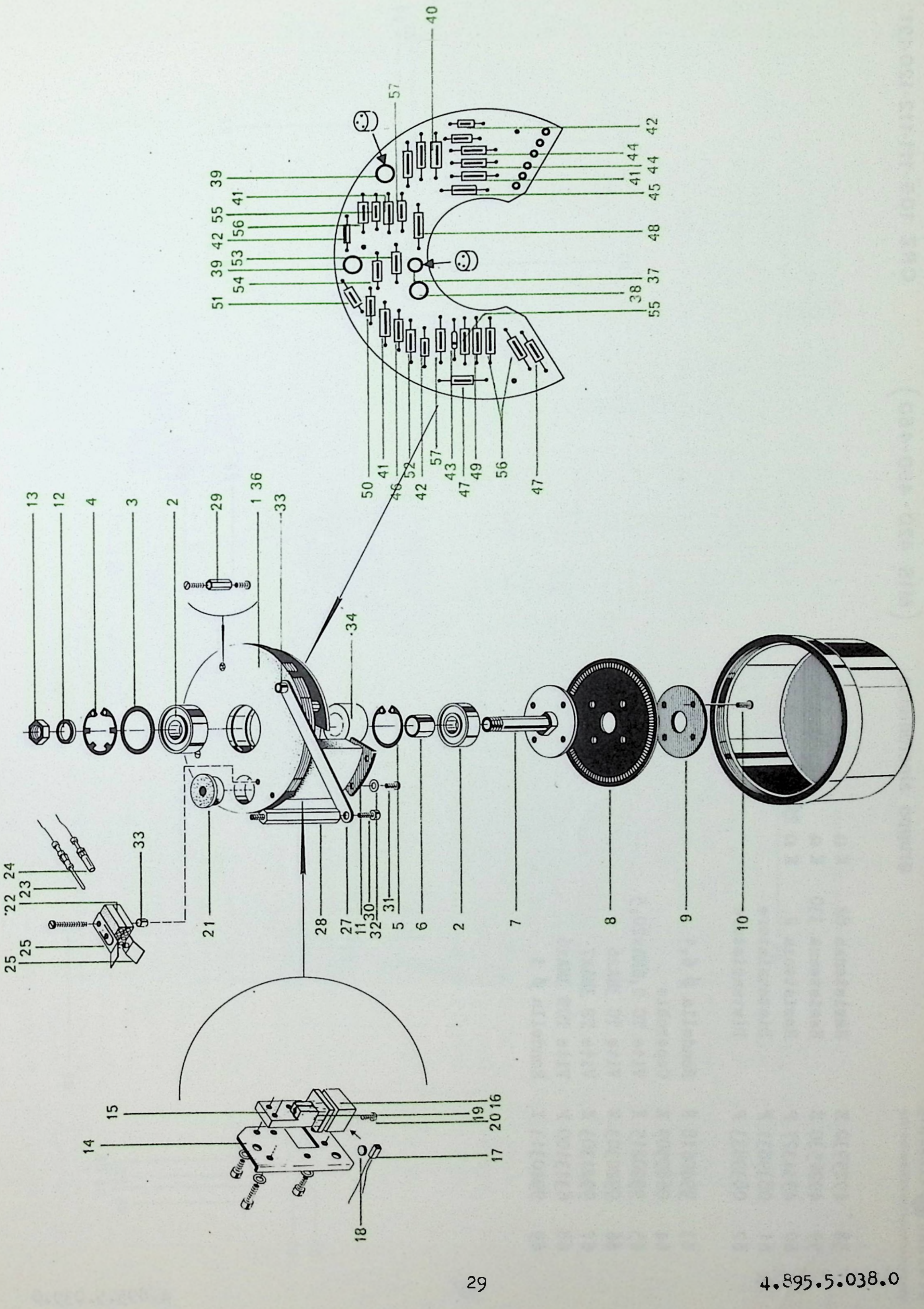
gruppo lettura (MIS 420-450-460) (dal n.s. 0161) CRZ 105-111-112-120-121

1	0689041 G	Leva supporto lente
2	0689462 M	Gruppo perno con flangia
3	0689461 H	Piastra per sistema portalente
4	0689460 G	Rondella di frizione
5	0689466 N	Squadretta per maniglia portalente
6	0689459 A	Balestra per frizione
7	0689517 P	Dado per manicotto
-	0689322 F	AG. Blocco lente completo
8	0689665 E	Lente
9	0689112 A	Supporto lente con spina
10	0689673 N	Gruppo maschera lente
11	9920308 L	Vite TC 3MAx16
12	9920301 N	Vite TC 3MAx10,8
13	9920303 W	Vite TC 3MAx6
14	0689047 R	Blocchetto lente
15	0689323 B	Telaietto completo di vetrino lente
16	6311238 P	Vite TC 3MAx30
17	0689455 H	Chiusura lente
18	0689028 C	Coperchio di protezione
19	0689109 B	Riparo lampada
-	0689020 D	AG. Cavo e testina fotolettura
-	0689022 J	AP. Gruppo contenitore fotocellula
20	0689650 B	Fondo contenitore
21	0689259 W	Contenitore fotocellule con spine
22	0834416 U	Etichetta ident.codice fotocellula
23	0689262 H	Gommino completo
24	0689029 G	Supporto contenitore
25	0689663 M	Piastrina connessione fotocellula
26	9925321 E	Vite TS 3MAx5,4
27	0680402 Y	Vite Rocca 1,7MAx8
28	5854216 L	Fotocellula BPY 10 80 ÷ 120 µA
29	5854215 G	Fotocellula BPY 10 40 ÷ 80 µA
30	0689030 E	Guarnizione
31	0689031 F	Fermacavo
32	0642052 K	Cavo completo per segnali
33	0680340 Z	Vite TC 4MAx8
34	0683685 T	Rondella elastica Ø 4,3
35	0689023 N	Blocco di lettura con vetrino
36	0689458 E	Pomello impugnatura
37	0689025 F	Volantino superiore lente
38	0689024 B	Volantino inferiore lente
39	6337111 Y	Anello elastico Ø 5
40	9920307 X	Vite TC 3MAx9
41	6313148 W	Vite TCE 6MAx15
42	9920306 T	Vite TC 3MAx23
43	0688018 F	Targhetta per lampada di lettura

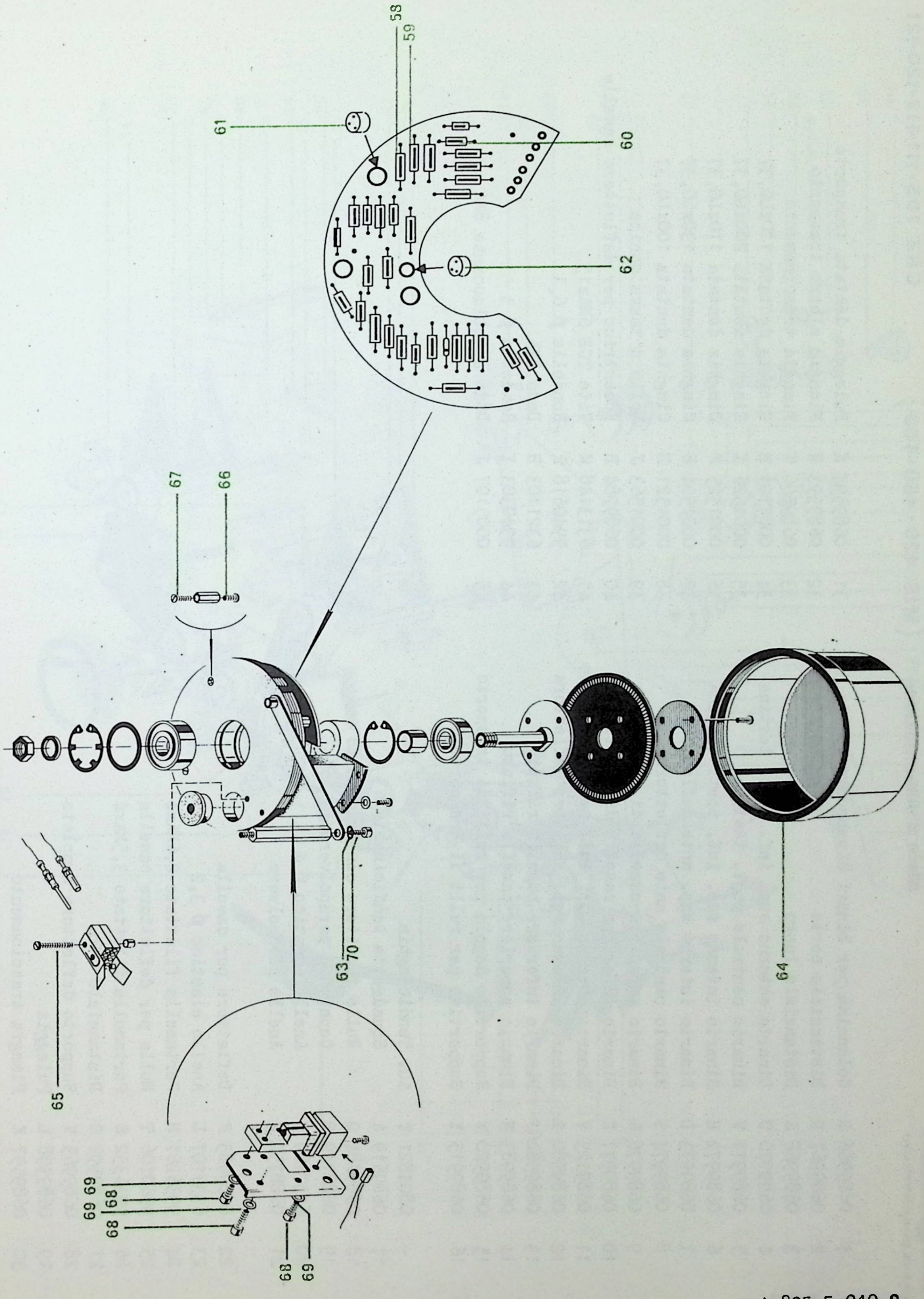


1	0689234 X	Supporto disco sincr. (fino a N.S.0473)
2	0000979 V	Cuscinetto 12x32x10
3	0689609 M	Rondella protez.cusc. (fino a N.S.0473)
4	0001564 F	Anello elast.a dentini ∅32(fino a N.S.0473)
5	6337522 M	Anello Seeger ∅ 32
6	0689514 B	Distanziale (fino a N.S. 0473)
–	0689143 H	AG. Gruppo disco di sincronismo
7	0689183 M	Manicotto con flangia
8	0689505 J	Disco fotoinciso di sincronismo
9	0689515 F	Flangia di ritegno
10	9920305 L	Vite TC 3MAx7
11	0689516 K	Mascherina fotoincisa
12	0689513 N	Rondella per cuscinetto
13	0689517 P	Dado per manicotto
–	0688114 X	AG. Gruppo di lettura
14	0689042 L	Supporto gruppo di lettura
15	0688111 S	Supporto guida luce
–	0689347 E	AP. Gruppetto fotocellula
16	0689993 P	Contenitore fotocellule
17	5854215 G	Fotocellula BPY 10 40÷80 µA
	5854216 L	Fotocellula BPY 10 80÷120 µA
18	0689266 A	Gommino per fotocellula
19	0689997 Q	Piastrina fiss. fotocellula
20	9920107 T	Vite TC 2MAx4,5
21	0689175 V	Tappo di gomma per supporto disco
22	0005176 H	Connettore AMP
23	0000885 B	Pin maschio AMP
24	0000887 K	Pin femmina AMP
25	0689526 L	Piastrina per fissaggio connettore
26	9940307 S	Distanziale

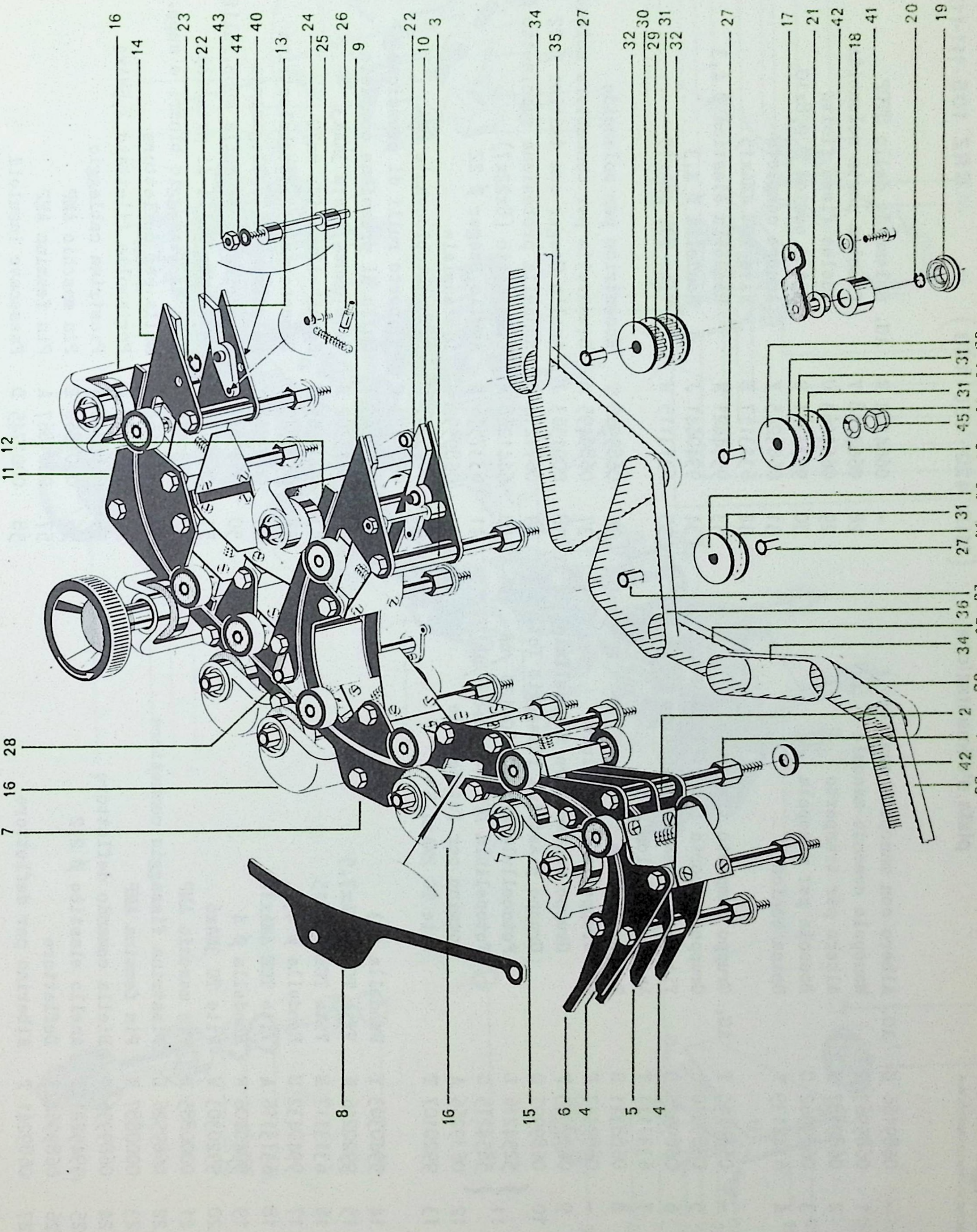
27	0689399 C	Asta di collegamento
28	0689213 G	Colonnina di ritegno
29	0689311 S	Distanziale circuito stampato
30	6313148 W	Vite TCE 6MAx15
31	9920307 X	Vite TC 3MAx9
32	9940324 B	Rondella ∅ 3,2
33	6313130 W	Vite 5MAx10
34	0688080 P	Distanziale est.disco sincr.
35	0688079 H	Distanziale
36	0688081 Q	Supporto disco sincr.
–	0620259 M	AG. Piastrina FODI
37	5835860 A	Transistor S.G.S. IW8907
38	0000726 N	Transistor S.G.S. IW8916
39	5835750 N	Transistor S.G.S. 2N1711
40	5003395 L	Condensatore 0,1 µF 63 V 20%
41	5037500 R	Condensatore 15 µF 20 V 20%
42	5031055 S	Condensatore 1 µF 10 V 20%
43	0000798 N	Diodo S.G.S. Ix8998/B
44	4922050 Z	Resistenza 0,010 K Ω
45	4922770 Y	Resistenza 0,056 K Ω
46	4934367 K	Resistenza 2,2 K Ω 2%
47	4933645 S	Resistenza 0,43 K Ω 2%
48	4934125 B	Resistenza 1,2 K Ω 2%
49	4935125 F	Resistenza 12 K Ω 2%
50	4934405 T	Resistenza 2,4 K Ω 2%
51	4933567 A	Resistenza 0,36 K Ω 2%
52	4934725 P	Resistenza 5,1 K Ω 2%
53	0001137 G	Resistenza 24 K Ω 2%
54	4935845 G	Resistenza 68 K Ω 2%
55	4934610 S	Resistenza 3,9 K Ω 2%
56	4933805 X	Resistenza 0,62 K Ω 2%
57	4935285 P	Resistenza 18 K Ω 2%



58	4925930 E	Resistenza 82	K Ω
59	4926530 Z	Resistenza 330	K Ω
60	4934327 P	Resistenza 2	K Ω 2%
61	0839831 F	Distanziatore	
62	0839833 P	Distanziatore	
63	9940618 R	Rondella ∅ 6,1	
64	0689509 K	Coperchio	
65	9920215 X	Vite TC 2,6MAx20,5	
66	9920303 W	Vite TC 3MAx6	
67	9921303 X	Vite TS 3MAx7	
68	6313100 F	Vite TCE 3MAx6	
69	9940313 Y	Rondella ∅ 3	

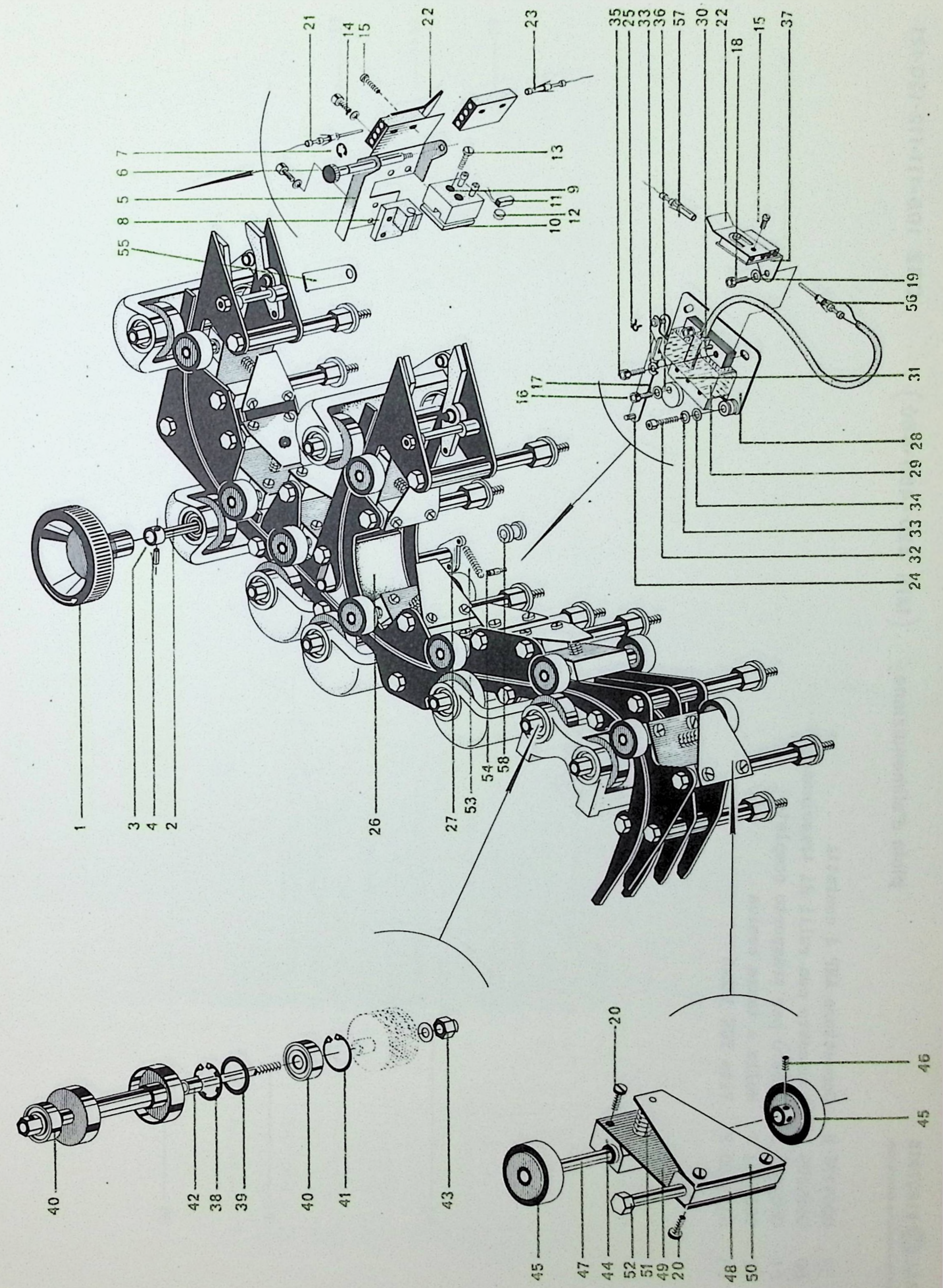


1	0689966 H	Colonnina per binari e supporto rulli
2	0689967 D	Distanziale corto
3	0689968 S	Distanziale lungo
4	0689970 U	Binario esterno sup. inf. post. testina
5	0689971 V	Binario centrale post. testina
6	0689972 H	Binario interno sup. inf. post. testina
7	0689973 D	Binario interno sup. ante deflettore
8	0689974 S	Binario centrale ante deflettore
9	0689976 A	Binario superiore casella di ricezione
10	0689977 E	Binario inferiore casella di ricezione
11	0689125 V	Binario esterno sup. inf. casella rifiuto
12	0689980 D	Binario interno sup. inf. per deflettore
13	0689982 J	Binario inferiore casella rifiuto
14	0689983 N	Binario superiore casella rifiuto
15	0689928 W	Supportino doppio per rulli di trasporto
16	0689915 Y	Supportino per rulli di trasporto
-	0804821 T	AG. Tendicinghia
17	0689619 A	Squadretta tendicinghia
18	0689484 Q	Rullo tenditore con cuscinetto
19	0688749 B	Coperchio parapolvere
20	6337109 D	Anello elastico ∅ 4
21	0688750 N	Anello parapolvere
22	0689985 F	Deflettore per casella
23	6337107 L	Anello elastico ∅ 3,2
24	9936261 M	Portamolla filettato 2,6MAx4
25	9960106 T	Molla per deflettore casella
26	9936352 S	Portamolla filettato 3,5MAx4
27	0689592 S	Distanziale
28	0689965 V	Supporto deflettore completo
29	0689598 L	Puleggia
30	0689597 X	Flangia trascinamento
31	0689594 K	Puleggia dentata trasporto
32	0689593 W	Flangia albero trasporto
33	0689596 T	Flangia trascinamento
34	0005101 H	Cinghia dentata 120xL0,37
35	0001526 K	Cinghia dentata 200xL0,37
36	0001525 F	Cinghia dentata 170xL0,37
37	0001524 B	Cinghia dentata 130xL0,37
38	0001521 E	Cinghia dentata 100xL0,37
39	0001563 J	Molla a tazza conica
40	0689984 B	Eccentrico per deflettore caselle
41	6313148 W	Vite TCE 6MAx15
42	9940618 R	Rondella ∅ 6,1
43	6321103 H	Dado 3MA
44	9940303 Y	Rondella ∅ 3
45	0005107 J	Dado autobloccante 8MA

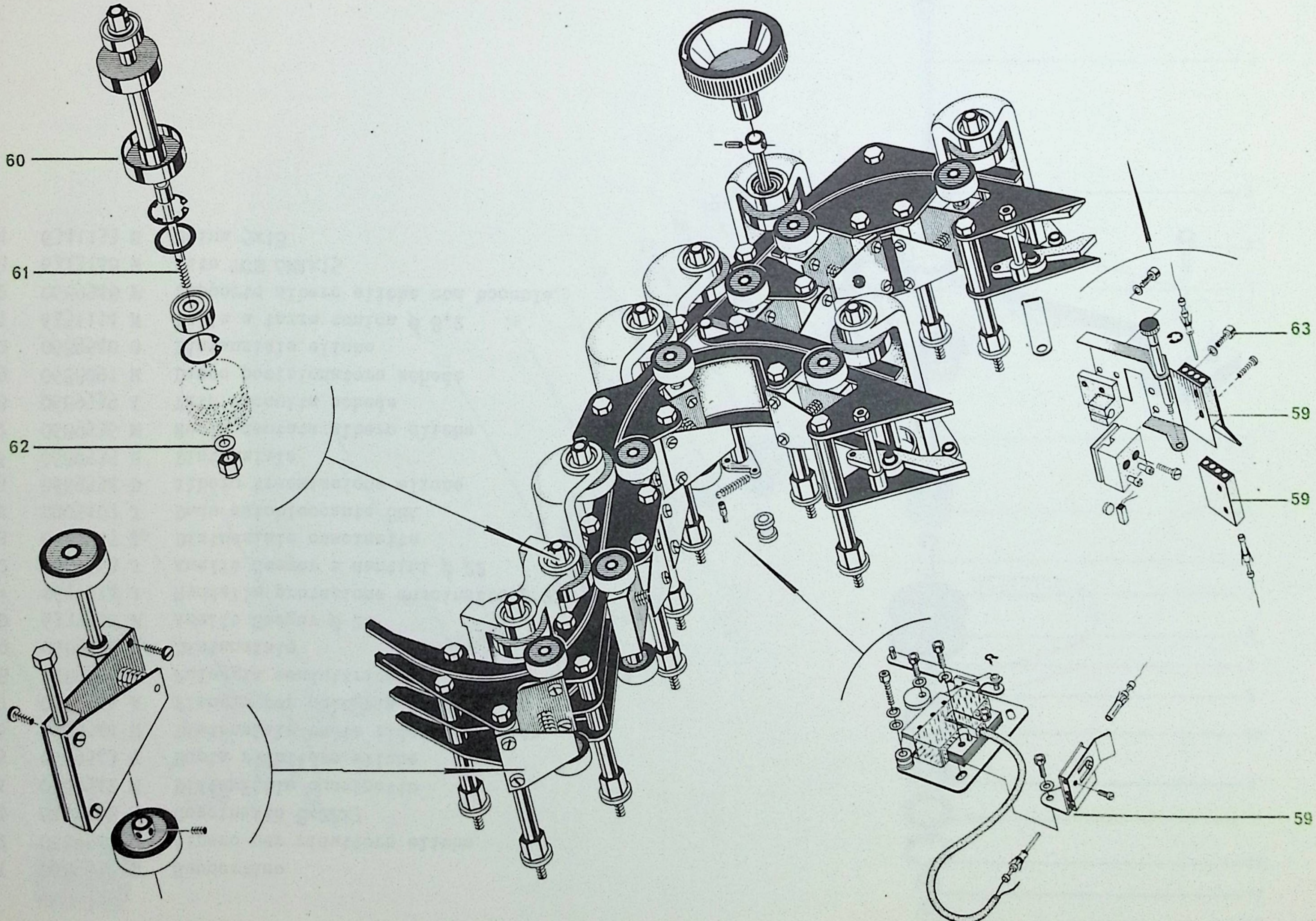


-	0689166	G	AG. Albero con manopola completo
1	0689963	Q	Manopola comando manuale
2	0689187	N	Albero per trasporto
3	0689962	G	Boccola per manopola
4	6342139	Y	Spina conica
-	0688115	T	AG. Gruppo completo traguardo
5	0689010	C	Gruppo supporto fotocellula
6	0689525	G	Vite per fissaggio supporto
7	6337111	Y	Anello elastico ∅ 5
8	0688111	S	Supporto guida luce
-	0689347	E	AP. Gruppetto fotocellula
9	0689993	P	Gruppo contenitore fotocellula
10	0689997	Q	Gruppo piastrina fissaggio fot.
11	5254216	L	Fotocellula BPY 10 80÷120 /uA
	5854215	G	Fotocellula BPY 10 40÷80 /uA
12	0639266	A	Gommino per fotocellule
13	9920107	T	Vite TC 2MAx4,5
14	9940303	Y	Rondella ∅ 3
15	9920216	N	Vite TC 2,6MAx7,5
16	6313117	E	Vite TCE 4MAx15
17	9940432	U	Rondella ∅ 4,2
18	6313116	A	Vite TCE 4MAx12
19	9940406	F	Rondella ∅ 4
20	9920303	W	Vite TC 3MAx6
21	0000885	B	Pin maschio AMP
22	0689526	L	Piastrina fissaggio connettore
23	0000887	K	Pin femmina AMP
24	0689956	G	Biella comando deflettore
25	9945221	E	Anello elastico ∅ 2,2
26	0689964	Z	Deflettore
27	0689241	T	Alberino per deflettore

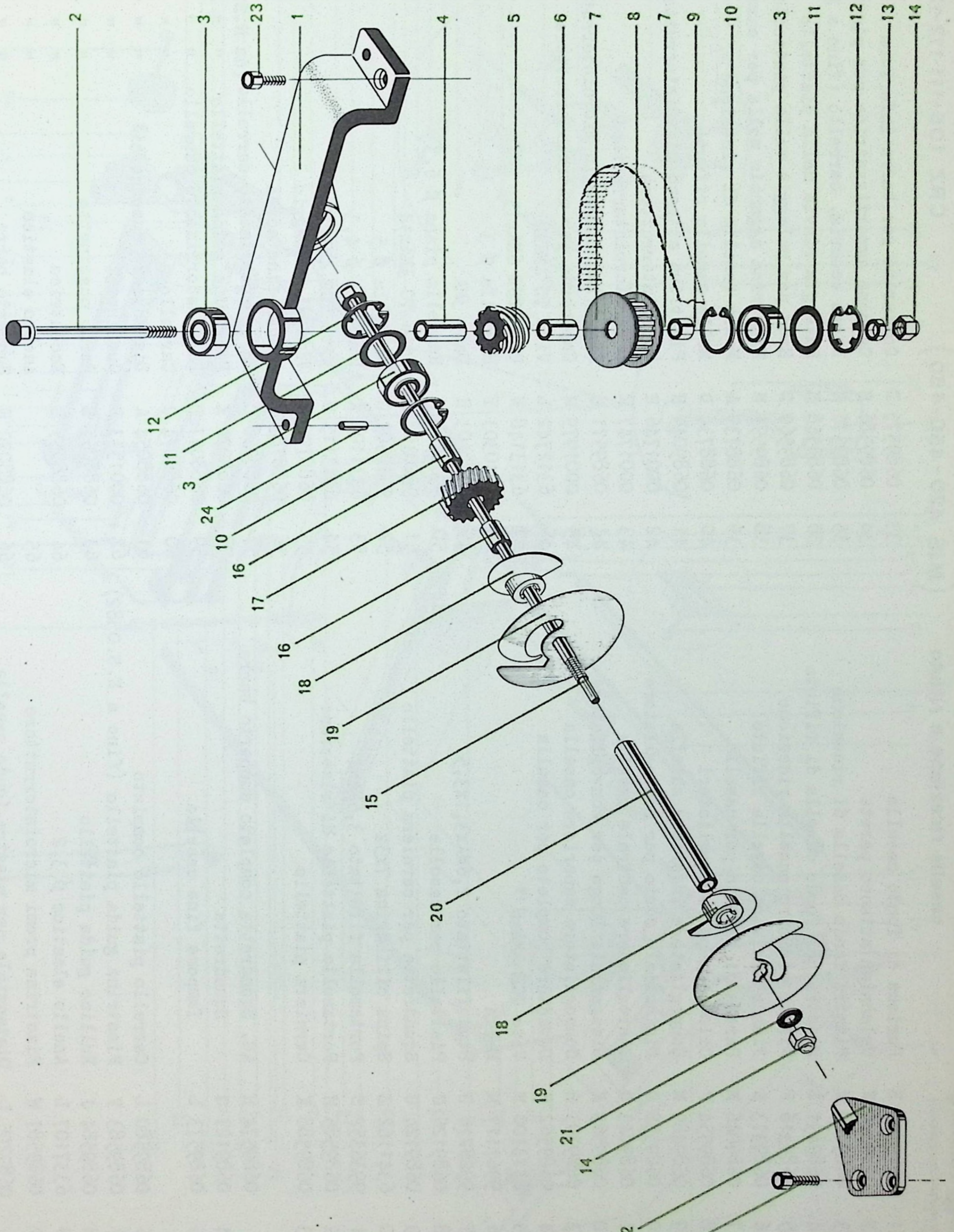
-	0664164	R	AG. Solenoide dello STOP
28	0663248	V	Piastra porta solenoide
29	0664163	U	Nucleo fisso finito
30	9933281	S	Spina conica ∅ 2,8x10
31	0663245	Y	Ancora completa
32	6313117	E	Vite TCE 4MAx15
33	9944421	N	Rondella elastica ∅ 4,3
34	9940441	J	Rondella ∅ 4,3
35	6313115	W	Vite TCE 4MAx10
36	0689960	T	Eccentrico per solenoide
37	0689495	M	Squadretta per connettore solenoide
38	0001563	J	Anello Seeger con dentini ∅ 22
39	0671214	J	Rondella protezione cuscinetto ∅ 22
40	6441208	M	Cuscinetto (8x22x7)
41	6337516	N	Anello Seeger ∅ 22
42	0689592	S	Distanziale
43	0005107	J	Dado autobloccante 8MA
44	0689123	F	Supporto rulli di pressione
45	0689244	Y	Rullo di pressione completo
46	9923302	B	Vite senza testa 3MAx3
47	0001545	H	Spina cilindrica 6x70
48	0689945	T	Blocchetto attacco balestrina
49	0689948	Y	Balestrina di collegamento
50	0689947	B	Piastrina porta molla supp.rulli press.
51	0689173	C	Molla per rulli di pressione
52	0689969	W	Vite di fissaggio binari e supp. rulli
53	9963164	N	Molla per deflettore
54	9936352	S	Portamolla filettato 3,5MAx4
55	0688746	N	Piastrina cablaggio
56	0001866	E	Pin maschio AMP
57	0001867	A	Pin femmina AMP
58	0001745	D	Passacavo insuloid



59	0005176 N	Connettore AMP 4 contatti
60	0689409 R	Manicotto con rulli di trascinamento
61	0689168 Z	Albero per trasporto completo
62	0001563 J	Molla a tazza conica
63	6313100 F	Vite TCE 3MAx6

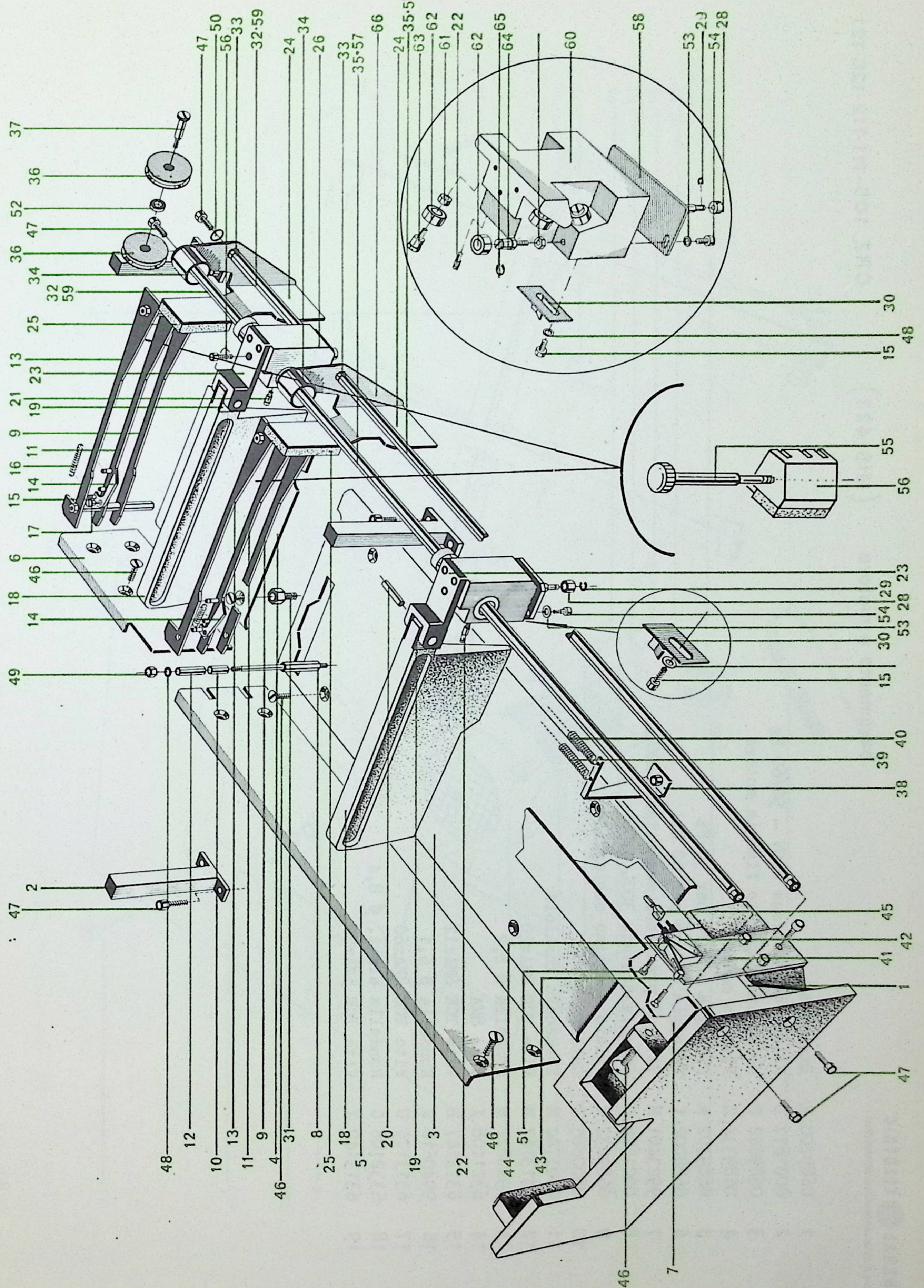


1	0689532 L	Supportino
2	0689541 H	Albero per riduttore eliche
3	6441208 M	Cuscinetto 8x22x7
4	0689542 M	Distanziale cuscinetto
5	0689543 R	Ruota riduttore eliche
6	0689544 E	Distanziale ruote riduttore elica
7	0689545 A	Flangia per puleggia dentata
8	0689598 L	Puleggia conduttrice
9	0689546 N	Distanziale
10	6337516 M	Anello Seeger Ø 22
11	0671214 J	Rondella protezione cuscinetto Ø 22
12	0001563 J	Anello Seeger a dentini Ø 22
13	0689547 J	Distanziale cuscinetto
14	0005107 J	Dado autobloccante 8MA
15	0689534 D	Albero trasmissione eliche
16	0689535 H	Distanziale
17	0689536 M	Ruota dentata albero eliche
18	0689539 A	Vite raccolta schede
19	0688091 R	Disco posizionatore schede
20	0689540 G	Distanziale eliche
21	6351114 N	Molla a tazza conica Ø 8,2
22	0689548 F	Supporto albero eliche con boccola
23	6313148 W	Vite TCE 6MAx15
24	6341133 S	Spina 5x18



caselle ricezione e rifiuto (MIS 420-450-460) CRZ 105-111-112-120-121

1	0689549 B	Fusione di fondo caselle
2	0689552 N	Colonnina attacco parete
3	0689490 K	Piastra fondo casella di ricezione
4	0689491 L	Piastra per fondo casella di rifiuto
5	0689316 F	Fianco sinistro casella ricezione
6	0689313 A	Fianco sinistro casella rifiuto
7	0689046 M	Parete di battuta per caselle
8	0689554 F	Colonnina per convogliatori
9	0689489 M	Convogliatore inferiore casella
10	0689558 G	Distanziale corto per convogliatore
11	0689043 Q	Convogliatore centrale casella
12	0689563 K	Distanziale lungo per convogliatore
13	0689395 B	Convogliatore superiore casella
14	0689562 P	Deviatore completo per casella
15	6313100 F	Vite TCE 3MAx6
16	9961117 M	Molla
17	9926216 U	Stud filettato 2,6MAx3,1x3,5
18	0689126 C	Piattello per caselle
19	0689124 U	Squadretta per cerniera piattello
20	6341162 Z	Spina cilindrica 7x32
21	9936352 S	Portamolla filettato 3,5MAx4
22	0689585 N	Portamolla piattello di ricezione
23	0689588 K	Cerniera piattello
-	0689574 H	AG. Squadretta completo supporto barre
24	0689127 G	Squadretta
25	0689573 L	Tampone fine casella
26	0689580 L	Carrello piattello completo
27	0689583 V	Piastrina guida piattello (fino a N.S.0582)
28	0689584 J	Rullino guida piattello
29	6337107 L	Anello elastico ∅ 3,2
30	0689587 W	Piastrina premi microinterruttore
31	0689205 L	Distanziale per piastra,fondo casella
32	0689577 M	Barra scorrim. carrello (fino a N.S.0582)
33	0689575 D	Collarino per barra inferiore
34	0689586 S	Campana ammortizzatrice per piattello
35	0689576 R	Barra scorrim. carrello (fino a N.S.0582)
36	0689568 H	Puleggia rinvio molla piattello
37	0689569 D	Stud per puleggia molla piattello
38	0689591 N	Piastrina aggancio molla per casella
39	0688739 A	Molla casella di ricezione
40	0688734 D	Molla casella rifiuto
41	0689045 H	Piastrina attacco microinterruttore
42	0001746 R	Microinterruttore
43	0001747 M	Leva microinterruttore
44	0689571 C	Piastrina fissaggio microinterruttore
45	0001979 W	Capocorda per microinterruttore
46	6312742 L	Vite TS 4MAx4
47	6313148 W	Vite TCE 6MAx15
48	9940303 Y	Rondella ∅ 3
49	6321103 H	Dado 3MA
50	9940618 R	Rondella piana ∅ 6,3
51	9920308 H	Vite TC 3MAx14
52	9940502 G	Rondella ∅ 5
53	6331104 X	Rondella ∅ 4,3
54	6313115 W	Vite TCE 4MAx10
55	0688792 S	Vite di fissaggio
56	0688789 P	Gruppo fine corsa
57	0688068 C	Barra scorrimento carrello (da N.S.0583)
58	0688072 K	Piastrina guida piattello " " "
59	0688067 P	Barra scorrimento carrello " " "
60	0688074 C	Carrello " " "
61	0688054 A	Distanziale cuscinetti " " "
62	0001533 P	Cuscinetti " " "
63	0688055 E	Perno cuscinetto " " "
64	0688055 E	Eccentrico " " "
65		Anello elastico " " "
66	0688070 E	Supporto barre " " "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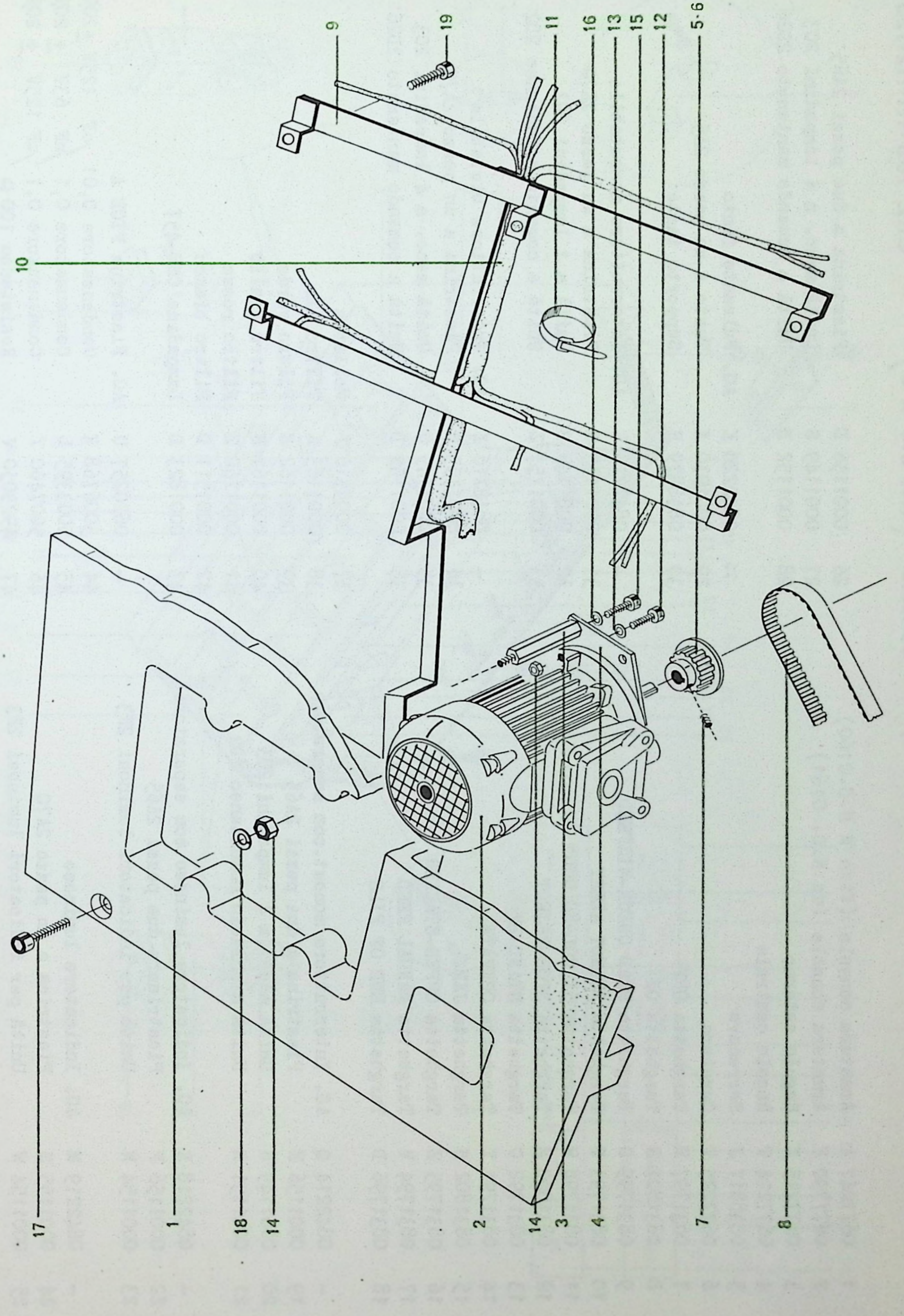
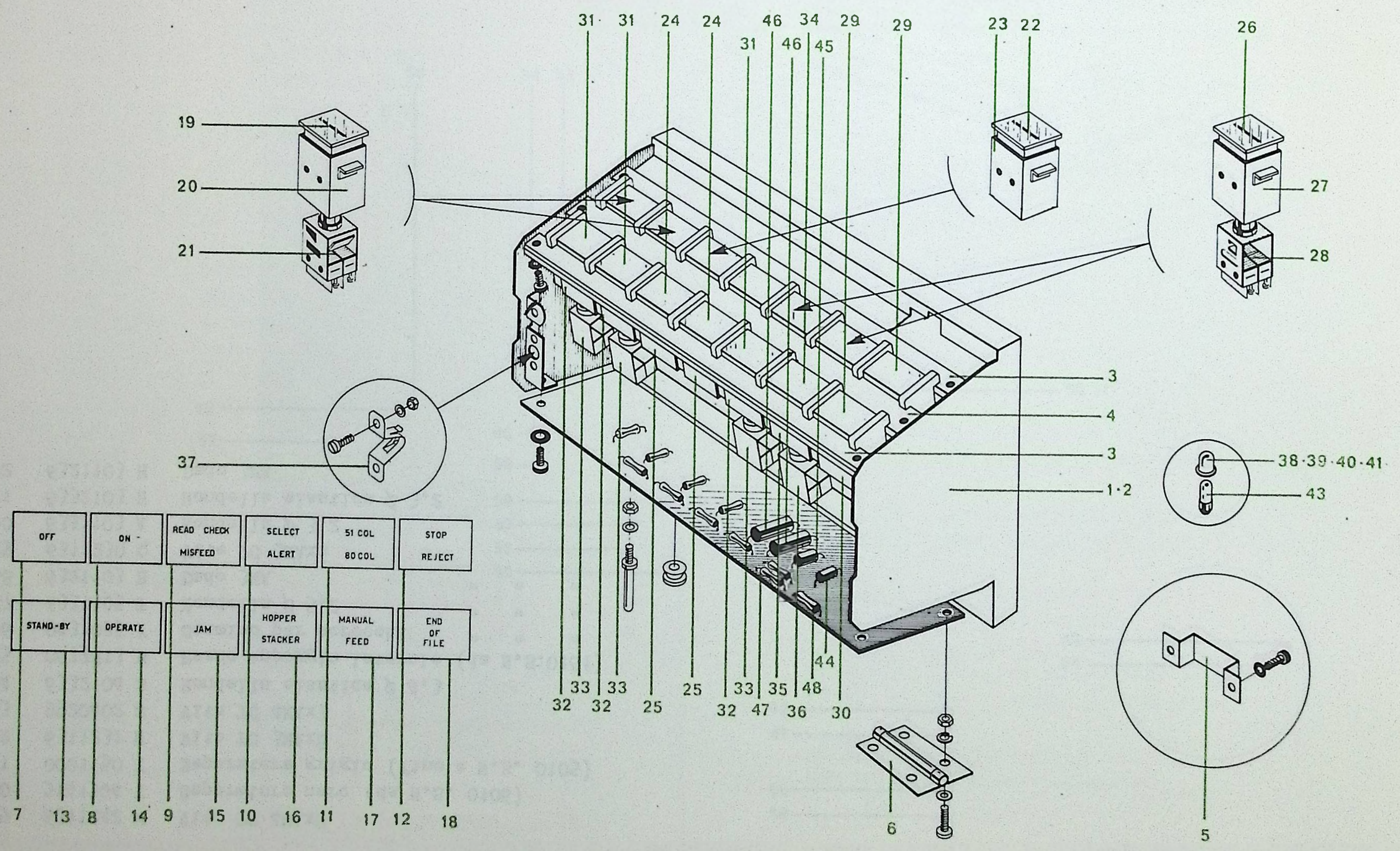
basamento e motore (MIS 423)

1	0689208 H	Basamento
2	0001817 D	Motore as. trifase 220V - 50/60 Hz
3	0689642 P	Colonnina supporto flangia motore
4	0689334 Z	Flangia motore
5	0689302 R	Puleggia motore per 50 Hz
6	0688002 Y	Puleggia motore per 60 Hz
7	9923401 H	Vite di pressione senza testa 4MAx4
8	0001528 C	Cinghia dentata 300L 0,50
9	0689232 E	Telaio sostegno cablaggio
10	0800685 F	Cablaggio
11	0001744 M	Fermacavo insuloid
12	6313167 B	Vite TCE 8MAx20
13	9940821 H	Rondella ø 8,2
14	6321108 X	Dado 8MA
15	6313147 H	Vite TCE 6MAx12
16	9940618 R	Rondella ø 6,1
17	6313175 U	Vite TCE 8MAx60
18	6332108 C	Rondella elast. ø 8,4
19	6313140 X	Vite TCE 5MAx50


5-6

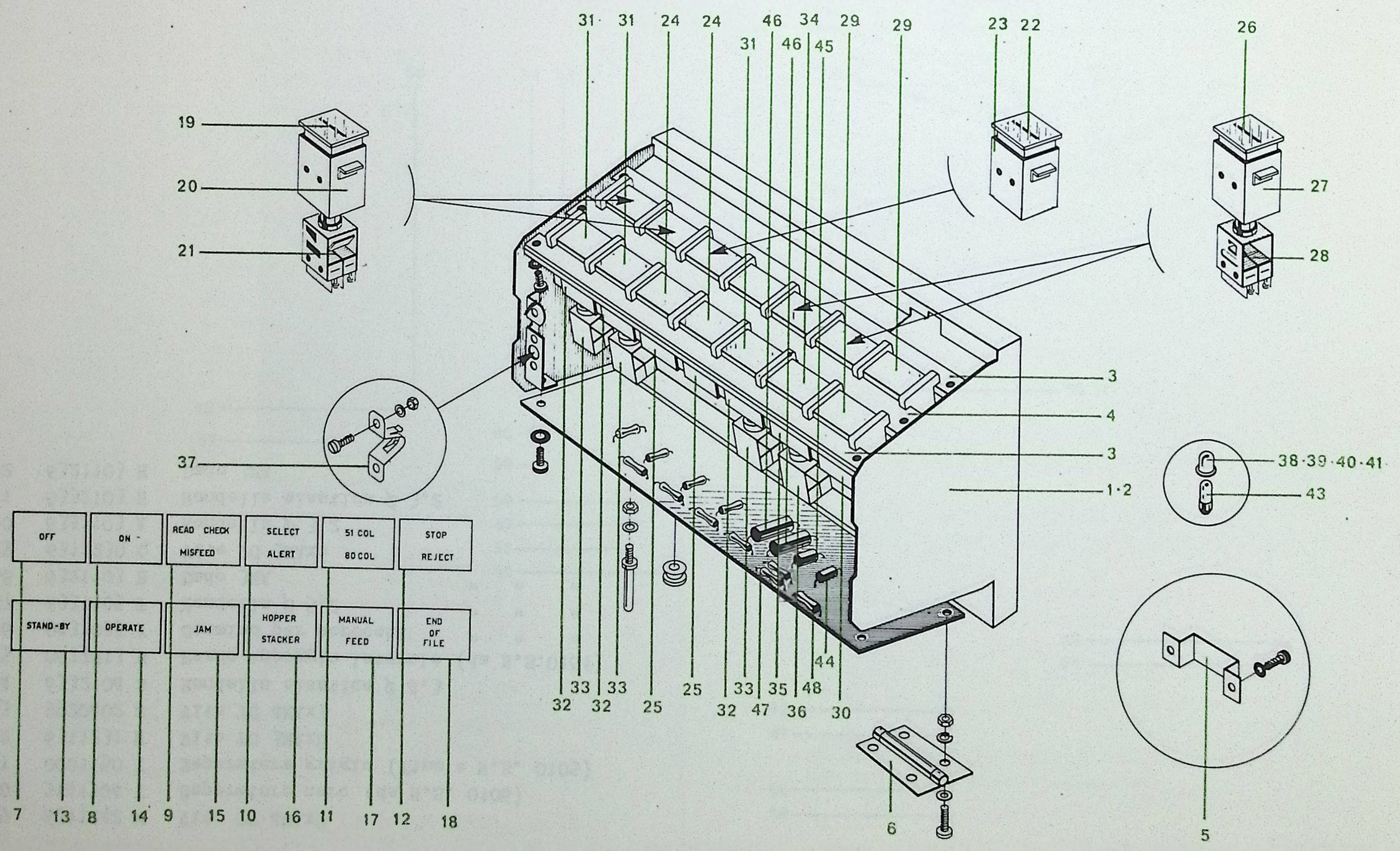
console (TAV 210 A B) CRZ 105-111-112-120-121

1	0677247 A	Armatura console (fino a N.S.0160)
2	0677790 P	Armatura console (da N.S. 0161)
3	0677215 X	Regolo esterno
4	0577214 T	Regolo centrale
5	0838817 J	Serracavo
6	0677225 Y	Cerniera
7	0831797 H	Targhetta OFF
8	0831801 N	Targhetta ON
9	0831799 S	Targhetta READ CHECK-MISFEED
10	0831793 G	Targhetta SELECT ALERT
11	0831798 W	Targhetta 51 COL-80 COL
12	0831800 M	Targhetta STOP-REJECT
13	0831792 C	Targhetta STAND-BY
14	0831791 Y	Targhetta OPERATE
15	0831802 S	Targhetta JAM
16	0831795 Z	Targhetta OPPER-STACKER
17	0831794 V	Targhetta MANUAL FEED
18	0831796 D	Targhetta END OF FILE
-	0842214 Q	AG. Interruttore monost.con separatore
19	0001156 E	Piastrina a due pezzi 2A65
20	0001149 S	Unità mecc. a 4 lampadini 2C3
21	0001151 Z	Unità a comando momentaneo 2D2
-	0842218 R	AG. Indicatore luminoso con separatore
22	0001156 F	Piastrina a due pezzi 2A65
23	0001154 W	Unità per indicatori luminosi 2F3
-	0842219 M	AG. Indicatore luminoso
24	0001155 S	Piastrina a un pezzo 2A70
25	0001154 W	Unità per indicatori luminosi 2F3
-	0842217 U	AG. Interruttore bistabile con separatore
26	0001156 E	Piastrina a due pezzi 2A65
27	0001149 S	Unità mecc. a 4 lampadini 2C3
28	0001152 D	Unità a comando mantenuto 2D26
-	0842220 K	AG. Pulsante finto
29	0001930 X	Tasto a un pezzo 2A5
30	0838879 H	Supporto tasto
-	0842215 L	AG. Interruttore monostabile
31	0001155 S	Piastrina a un pezzo 2A70
32	0001149 S	Unità a 4 lampadini 2C3
33	0001151 Z	Unità a comando momentaneo 2D2
-	0842216 Y	AG. Interruttore bistabile
34	0001155 S	Piastrina a un pezzo 2A70
35	0001149 S	Unità mecc. a 4 lampadini 2C3
36	0001152 D	Unità a comando mantenuto 2D26
37	0005316 F	Molletta
38	0001163 A	Filtro blu
39	0001162 E	Filtro verde
40	0001161 S	Filtro giallo
41	0001160 Z	Filtro rosso
42	0001511 D	Filtro bianco
43	0001823 D	Lampadina CMB-457
-	0620257 U	AG. Piastrina FICE A
44	5006768 K	Condensatore 0,01 /uF 125V ±20%
45	5003395 L	Condensatore 0,1 /uF 63V ± 20%
46	5007400 Y	Condensatore 0,1 /uF 125V ± 20%
47	4923050 V	Resistenza 100 Ω
48	4924370 H	Resistenza 2,2 KΩ

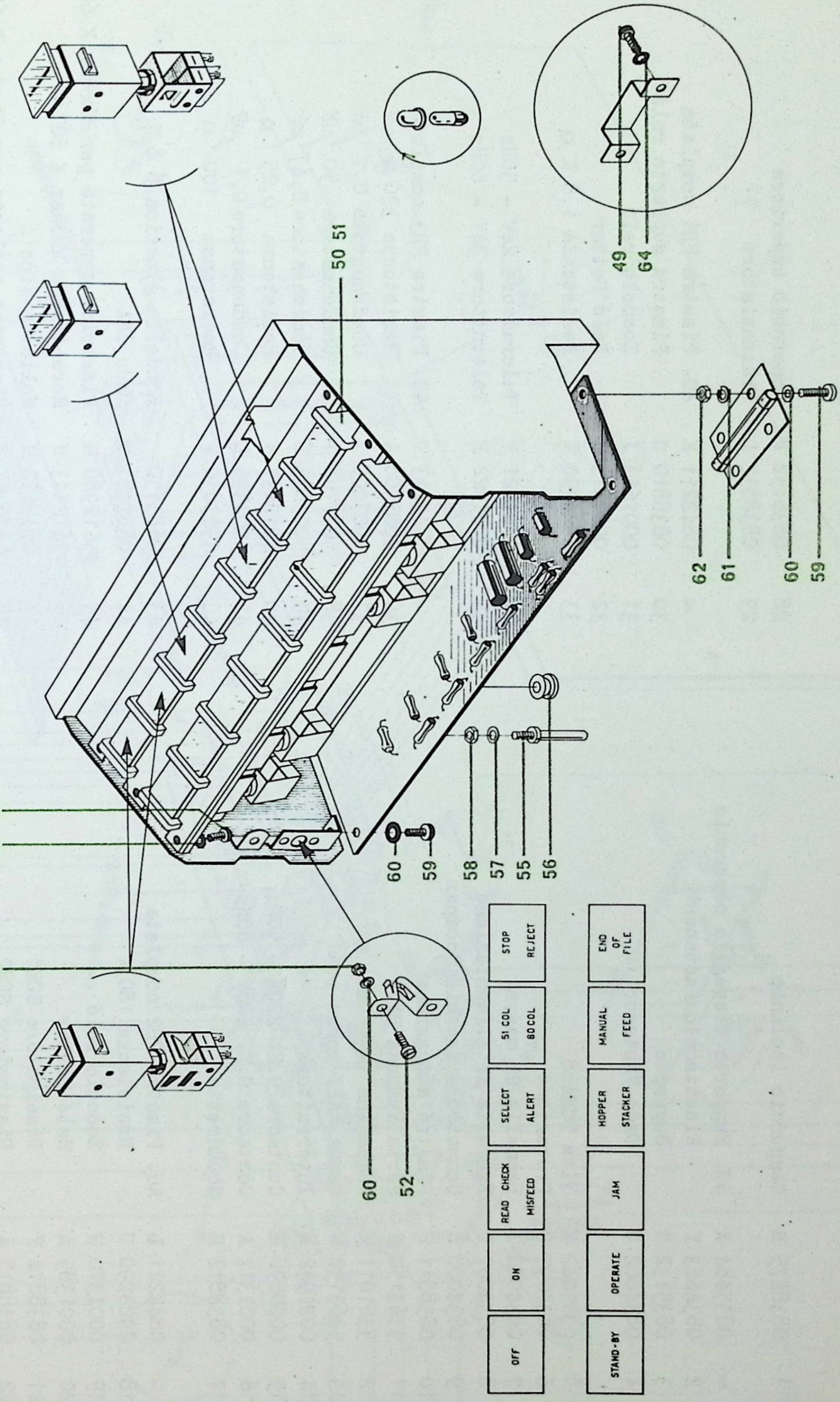


console (TAV 210 A B) CRZ 105-111-112-120-121

1	0677247 A	Armatura console (fino a N.S.0160)
2	0677790 P	Armatura console (da N.S. 0161)
3	0677215 X	Regolo esterno
4	0577214 T	Regolo centrale
5	0838817 J	Serracavo
6	0677225 Y	Cerniera
7	0831797 H	Targhetta OFF
8	0831801 N	Targhetta ON
9	0831799 S	Targhetta READ CHECK-MISFEED
10	0831793 G	Targhetta SELECT ALERT
11	0831798 W	Targhetta 51 COL-80 COL
12	0831800 M	Targhetta STOP-REJECT
13	0831792 C	Targhetta STAND-BY
14	0831791 Y	Targhetta OPERATE
15	0831802 S	Targhetta JAM
16	0831795 Z	Targhetta OPPER-STACKER
17	0831794 V	Targhetta MANUAL FEED
18	0831796 D	Targhetta END OF FILE
-	0842214 Q	AG. Interruttore monost.con separatore
19	0001156 E	Piastrina a due pezzi 2A65
20	0001149 S	Unità mecc. a 4 lampadini 2C3
21	0001151 Z	Unità a comando momentaneo 2D2
-	0842218 R	AG. Indicatore luminoso con separatore
22	0001156 F	Piastrina a due pezzi 2A65
23	0001154 W	Unità per indicatori luminosi 2F3
-	0842219 M	AG. Indicatore luminoso
24	0001155 S	Piastrina a un pezzo 2A70
25	0001154 W	Unità per indicatori luminosi 2F3
-	0842217 U	AG. Interruttore bistabile con separatore
26	0001156 E	Piastrina a due pezzi 2A65
27	0001149 S	Unità mecc. a 4 lampadini 2C3
28	0001152 D	Unità a comando mantenuto 2D26
-	0842220 K	AG. Pulsante finto
29	0001930 X	Tasto a un pezzo 2A5
30	0838879 H	Supporto tasto
-	0842215 L	AG. Interruttore monostabile
31	0001155 S	Piastrina a un pezzo 2A70
32	0001149 S	Unità a 4 lampadini 2C3
33	0001151 Z	Unità a comando momentaneo 2D2
-	0842216 Y	AG. Interruttore bistabile
34	0001155 S	Piastrina a un pezzo 2A70
35	0001149 S	Unità mecc. a 4 lampadini 2C3
36	0001152 D	Unità a comando mantenuto 2D26
37	0005316 F	Molletta
38	0001163 A	Filtro blu
39	0001162 E	Filtro verde
40	0001161 S	Filtro giallo
41	0001160 Z	Filtro rosso
42	0001511 D	Filtro bianco
43	0001823 D	Lampadina CMB-457
-	0620257 U	AG. Piastrina FICE A
44	5006768 K	Condensatore 0,01 /uF 125V ±20%
45	5003395 L	Condensatore 0,1 /uF 63V ± 20%
46	5007400 Y	Condensatore 0,1 /uF 125V ± 20%
47	4923050 V	Resistenza 100 Ω
48	4924370 H	Resistenza 2,2 KΩ



49	6311242 W	Vite TC 4MAx8	
50	5141504 Y	Separatore nero (da N.S. 0106)	
51	0001150 Y	Separatore grigio (fino a N.S. 0105)	
52	6311231 R	Vite TC 3MAx8	
53	9920402 C	Vite TC 4MAx7	
54	6332104 B	Rondella elastica ∅ 4,3	
55	0677813 B	Perno appoggio laterale	(da N.S.0161)
56	9431035 Y	Gommino per scrocchi	" " "
57	6331105 T	Rondella ∅ 5,2	" " "
58	6321103 H	Dado 3MA	" " "
59	6311230 Q	Vite TC 3MAx6	
60	6331103 A	Rondella ∅ 3,2	
61	6332103 H	Rondella elastica ∅ 3,2	
62	6321103 H	Dado 3MA	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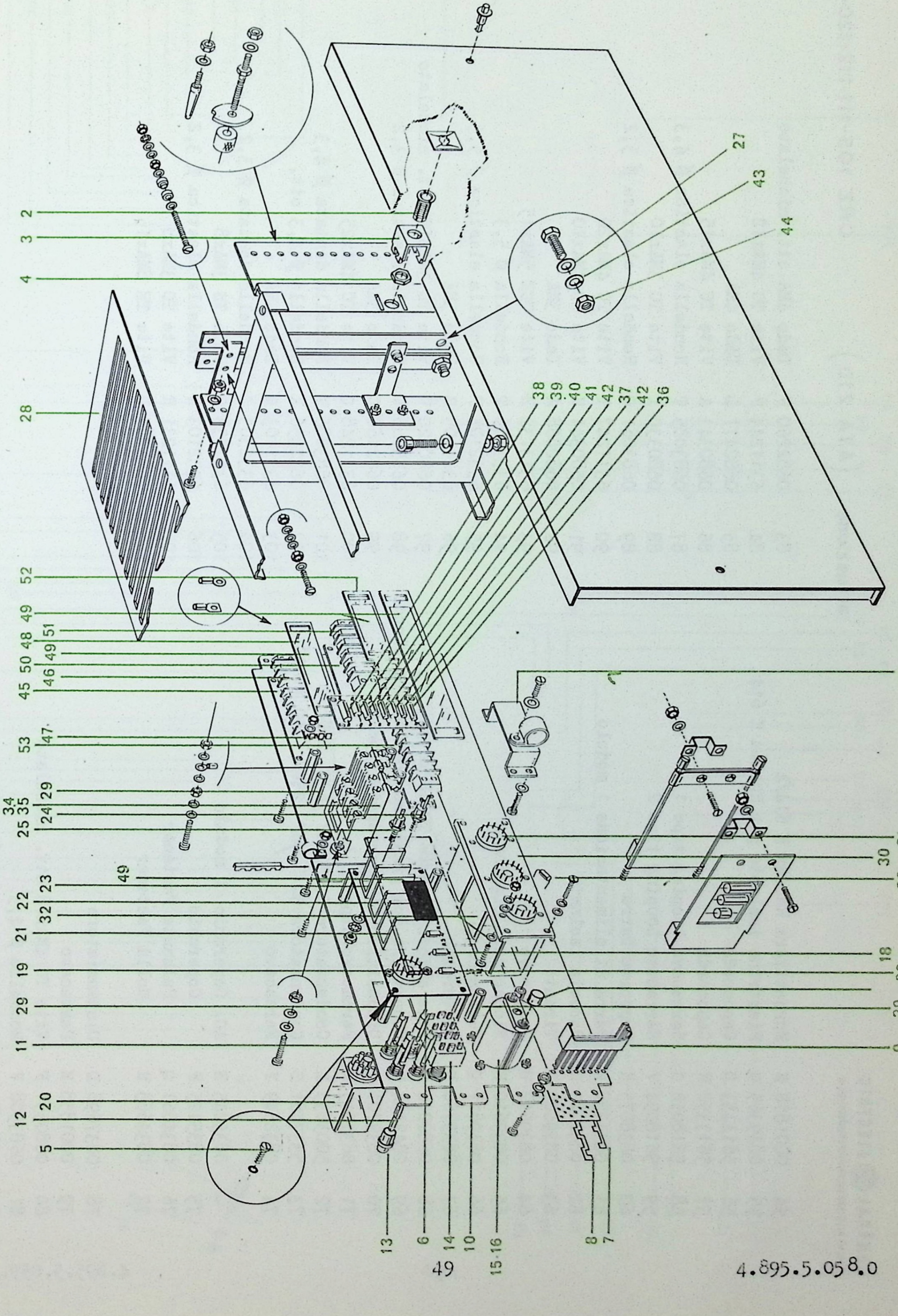
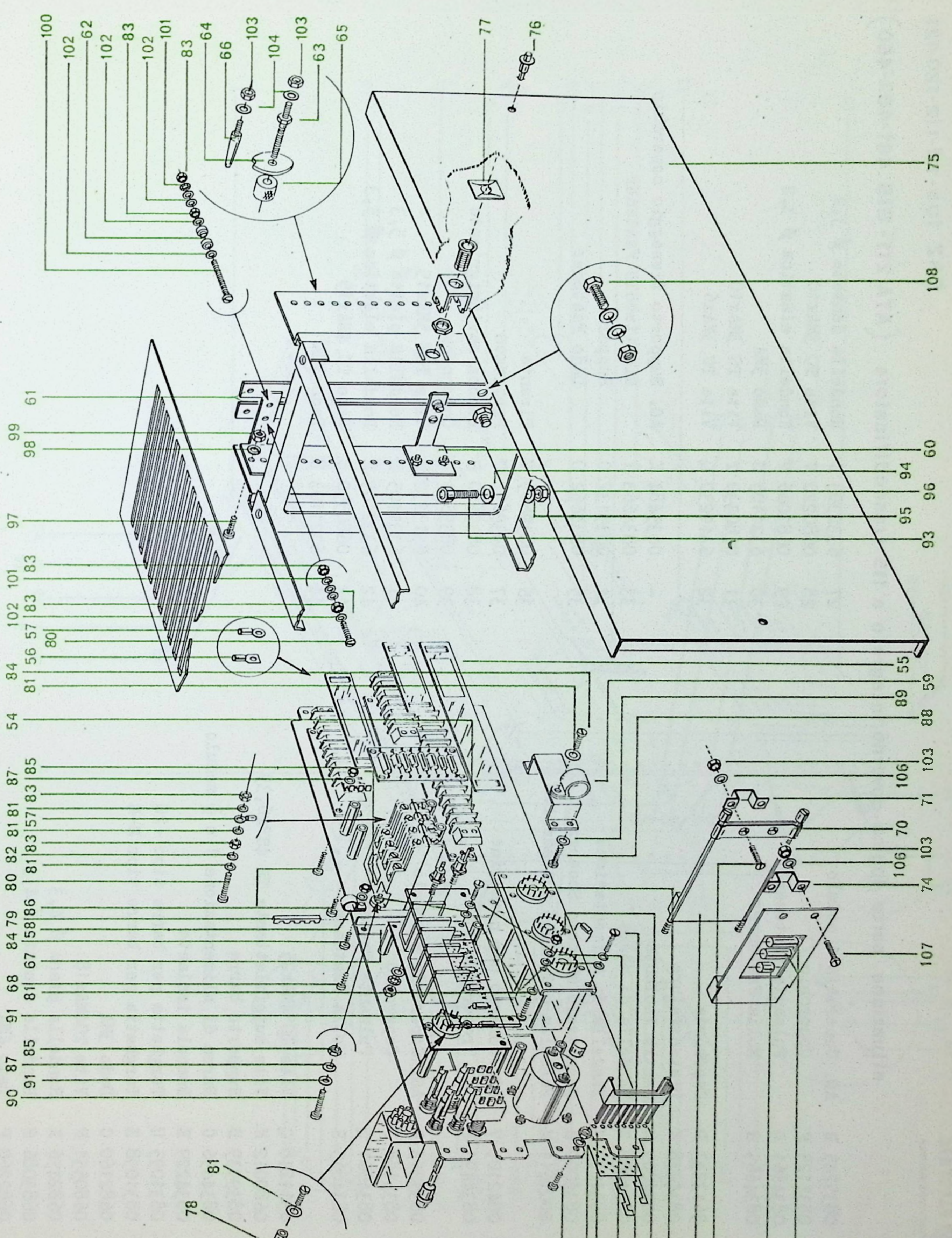
53
50 51
60
52
60
59
58
57
55
56
62
61
60
59
49
64
OFF
ON
READ CHECK MISFEED
SELECT ALERT
51 COL 80 COL
STOP REJECT
STAND-BY
OPERATE
JAM
HOPPER STACKER
MANUAL FEED
END OF FILE

1	0838275 B	Cappuccio isolante
–	0835484 X	AG. Supporto fissaggio coperchio
2	0834663 Y	Ricettacolo Fastener
3	0835132 C	Supporto
4	0834662 U	Dado Fastener
5	6311242 W	Vite TCM4x8
6	0837697 G	Protezione
7	0834008 Z	Bandella di massa
8	0834007 C	Bandella di alimentazione
9	0834000 S	Connettore maschio Socapex
10	0838811 H	Piastra attuazione
11	5363150 N	Porta lampada RAFI
12	5361011 M	Lampadina 12V 20mA
13	5363152 W	Gemma RAFI rossa
14	0001942 K	Interruttore
15	0000898 H	Contaore G.E. 220V – 50Hz
16	0001317 A	Contaore G.E. 208V – 60Hz
17	0838812 M	Squadretta
–	0842221 L	AG. Piastra PB2 completa
18	4923290 U	Resistenza 180 Ω
19	0001370 W	Zoccolo relé
20	0001385 A	Relé Potter
21	0838814 F	Dissipatore SCR1
22	0838815 A	Dissipatore SCR2
23	0838816 N	Dissipatore SCR3
24	5822015 Z	Diodo SCR C15D
25	5824032 X	Diodo BYZ–12
26	4922690 G	Resistenza 47 Ω
27	0683131 F	Rondella ∅ 8,2
28	0836158 K	Coperchio superiore
29	0838837 L	Distanziatore
–	0842211 K	AG. Piastra PB1 completa
30	0838810 G	Piastra supporto relé
31	0001663 J	Zoccolo relé
32	0001313 H	Relé Potter
33	4924290 R	Resistenza 1,8 K Ω
34	0001821 V	Teleruttore 24V – 50Hz
35	0001822 H	Teleruttore 24V – 60Hz
–	0842213 T	AG. Piastra PB3 completa
36	0001308 A	Resistenza 330 Ω
37	5007400 Y	Condensatore 0,1 μF
38	5037781 J	Condensatore 50 μF
39	5003635 L	Condensatore 0,47 μF
40	4940437 V	Resistenza 0,25 Ω
41	5003395 L	Condensatore 0,1 μF
42	4923050 V	Resistenza 100 Ω
43	0683130	Rondella elastica ∅ 8,4
44	0682481 V	Dado 8MA
45	5612988 H	Piastrina numerata per Rhodex K 607
46	5612543 N	Morsettiera Rhodex K 607/A
47	0839653 U	Molletta tipo A
48	0839358 C	Piastrina isolante per Rhodex K 607
49	0831766 S	Targhetta
50	0000867 H	Piastrina numerata per Rhodex K 605
51	0000748 B	Morsettiera Rhodex K 605/A
52	0839356 K	Piastrina isolante per Rhodex K 605
53	0001819 A	Piastrina numerata per Rhodex K 614

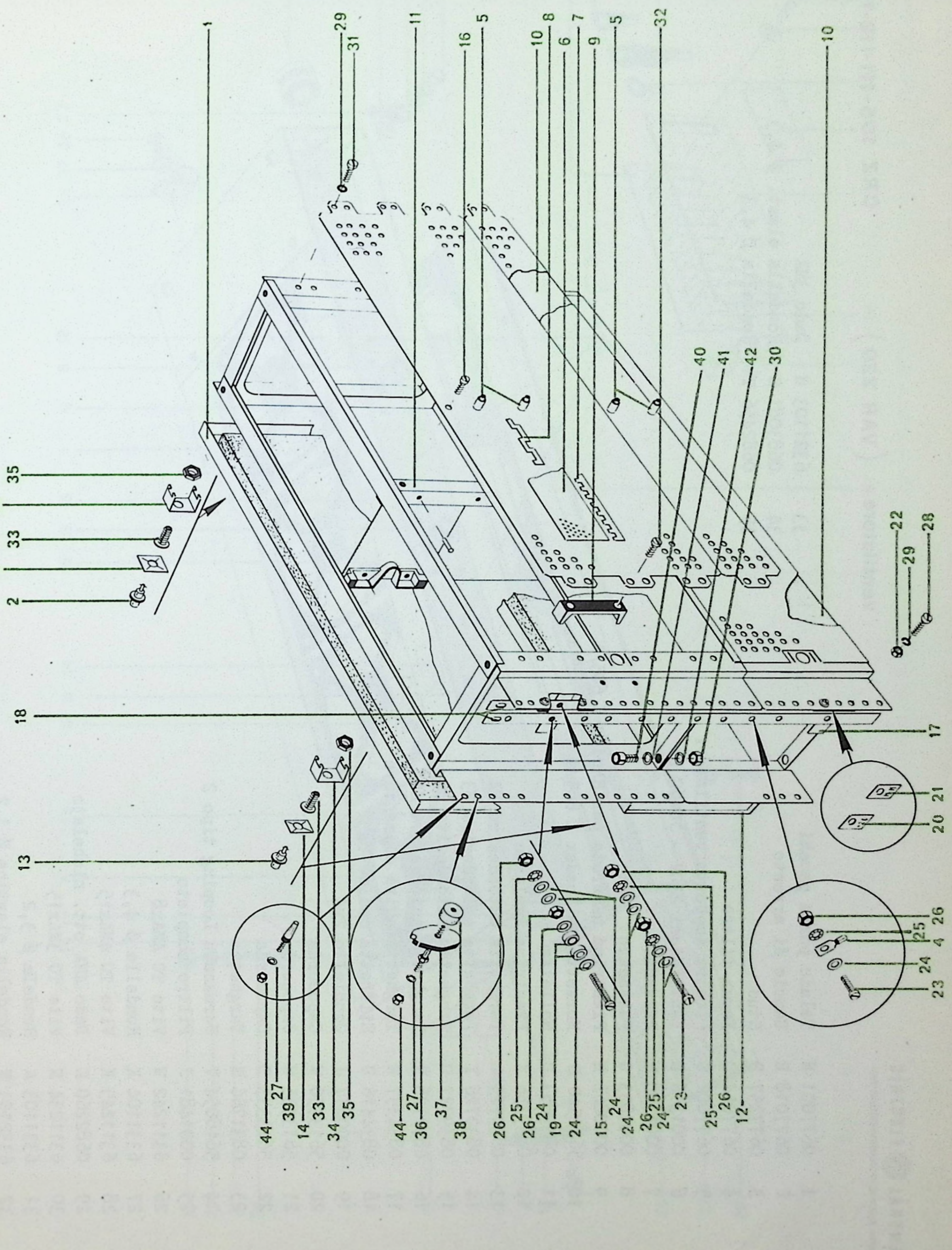

15-16

54	0001818 S	Morsettiera Rhodex K 614/A
55	0839365 G	Piastrina isolante per Rhodex K 614
56	5613333 D	Capocorda
57	5613350 W	Capocorda
58	5618052 C	Serracavo Looping tipo 1
59	5618054 V	Serracavo Looping tipo 2
60	0838675 K	Supporto barra
61	0834398 K	Barre di alimentazione 1 modulo
62	0834229 E	Boccola isolante
63	0839609 V	Tirante
64	0839612 U	Premicavo
65	0839610 P	Blocco cavi zigrinato
66	0839611 Q	Colonnina
67	0839760 N	Traversino
68	0680012 N	Vite autofilettante TP 4SPx6,35
69	0842184 V	Connettore con piastrina completo di blocc.
70	0839701 V	Dispositivo di bloccaggio tipo 1
71	0834545 M	Fermacavo tipo 2
72	5003635 L	Condensatore 0,47 /uF 63VL 20%
73	5337781 S	Condensatore 50 /uF 25VL -10 +100%
74	0832549 Y	Fermacavo
-	0835245 B	AG. Coperchio 1 modulo
75	0835125 F	Coperchio
76	0834661 Q	Pulsante Fastener
77	0834665 R	Molla Fastener
78	0837698 D	Distanziatore
79	0001858 W	Passacavo
80	0680551 F	Vite TC 4MAx18 ott. nichelato
81	0683508 V	Rondella Ø 4,3
82	0683081 S	Rondella elastica Ø 4,3
83	0682260 F	Dado 4MA ott. nichelato
84	6311244 P	Vite TC 4MAx12
85	0682471 L	Dado 4MA
86	0680343 A	Vite TC 4MAx15
87	0683085 T	Rondella elastica Ø 4,3
88	0680330 Y	Vite TC 3MAx10
89	0683061 Q	Rondella elastica Ø 3,2
90	6311247 T	Vite TC 4MAx20
91	0680341 S	Vite TC 4MAx10
92	0682868 A	Dado 3MA
93	6313132 B	Vite TCE 5MAx15
94	6331105 T	Rondella Ø 5,3
95	6332105 F	Rondella elastica Ø 5,3
96	6321105 S	Dado 5MA
97	0680220 V	Vite TC 3MAx10 ott. nichelato
98	0683066 V	Rondella elastica Ø 3,2
99	0682160 C	Dado 3MA
100	6311248 Q	Vite TC 4MAx25
101	0683086 F	Rondella dentata Ø 4,3
102	0682456 X	Rondella Ø 4,3 ott.
103	6321103 H	Dado 3MA
104	6332303 J	Rondella dentata Ø 3,2
105	6312733 P	Vite TS 3MAx8
106	6332103 N	Rondella elastica Ø 3,2
107	6311231 R	Vite TC 3MAx8
108	0681290 D	Vite TE 8MAx15



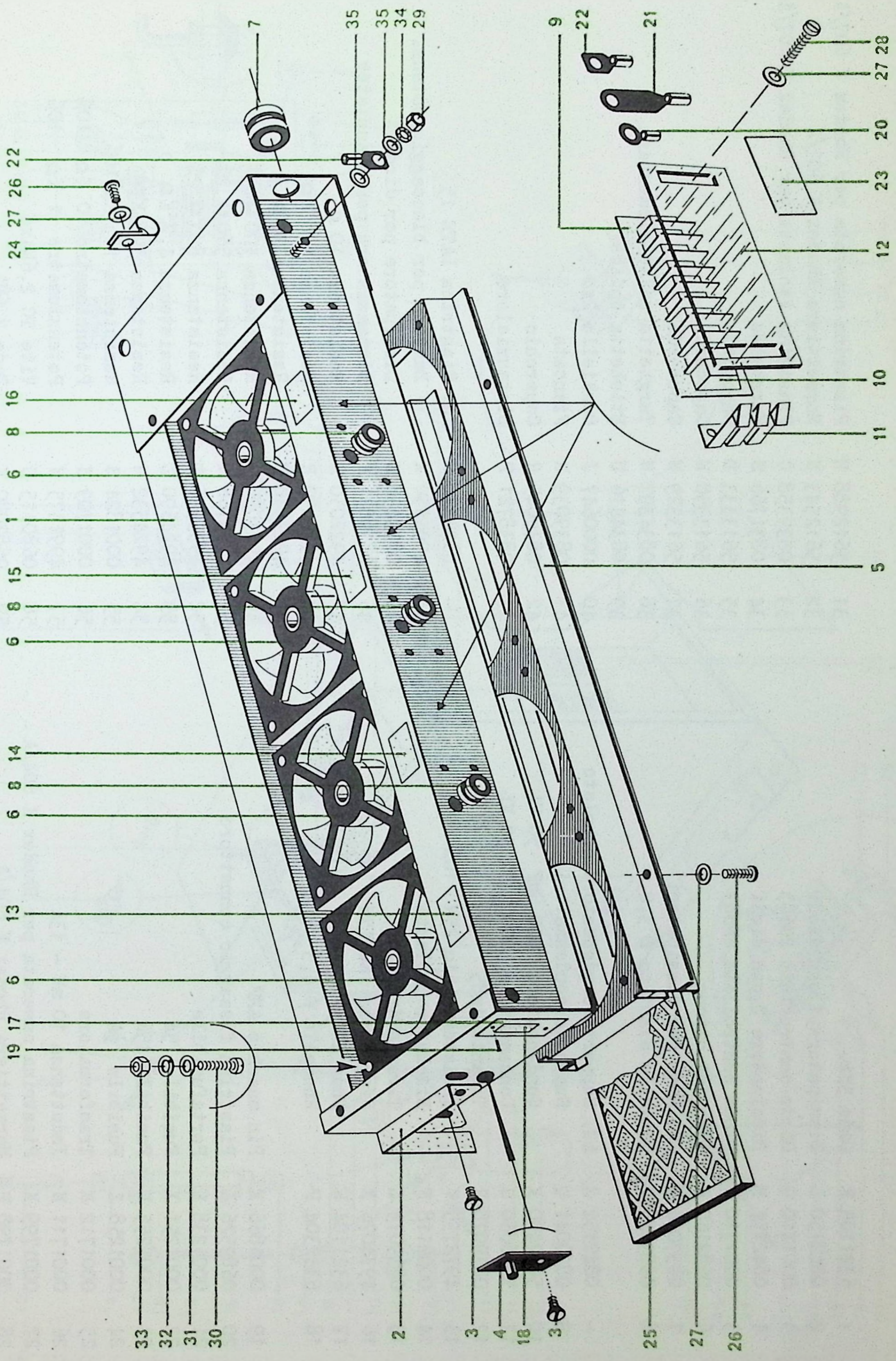
attuazione parte logica-governo integrato a 115-trascodificatore (ATA 211 - GIS 481-482-450)

-	0835245 B	AG. Coperchio 1 modulo
1	0835125 F	Coperchio
2	0834661 Q	Pulsante Fastener
3	0834665 R	Molla Fastener
4	5613333 D	Capocorda
5	0834478 K	Distanziatore
6	0834009 V	Nastro isolante
7	0834008 Z	Bandella di massa
8	0834007 C	Bandella di alimentazione
9	0834000 S	Connettore maschio Socapex
10	0001611 M	Bandella alluminio autoadesiva
-	0842105 V	AG. Schermo per piastrine
11	0834493 F	Traversino
-	0835213 P	AG. Coperchio $\frac{1}{2}$ modulo
12	0835188 J	Coperchio
13	0834661 Q	Pulsante Fastener
14	0834665 R	Molla Fastener
15	6311248 Q	Vite TC 4MAx25
16	0680012 N	Vite autofilettante TP 4SPx6,35
17	0839939 B	Supporto barre
18	0834496 C	Barra di alimentazione 1 e $\frac{1}{2}$ modulo
19	0834229 E	Boccola isolante
20	0831095 U	Targhetta per barre tipo +20
21	0831098 Z	Targhetta per barre tipo M-M
22	0682160 C	Dado 3MA
23	0680551 F	Vite TC4MAx18
24	0682456 X	Rondella piana Ø 4,3
25	0683086 F	Rondella dentata Ø 4,3
26	0682260 F	Dado 4MA
27	6332303 J	Rondella dentata Ø 3,2
28	0680220 V	Vite TC 3MAx10
29	0683066 V	Rondella elastica Ø 3,2
30	6321105 S	Dado 5MA
31	0680330 Y	Vite TC 3MAx10
32	6311230 Q	Vite TC 3MAx6
-	0835484 X	AG. Supporto fissaggio coperchio
33	0834663 Y	Ricettacolo Fastener
34	0835132 C	Supporto
35	0834662 U	Dado Fastener
36	0839609 V	Tirante
37	0839612 U	Premicavo
38	0839610 P	Blocca cavi zigrinato
39	0839611 Q	Colonnina
40	6313132 B	Vite TCE 5MAx15
41	6331105 T	Rondella piatta Ø 5,3
42	6332105 F	Rondella elastica Ø 5,3
43	0680550 E	Vite TC 4MAx15
44	6321103 H	Dado 3MA



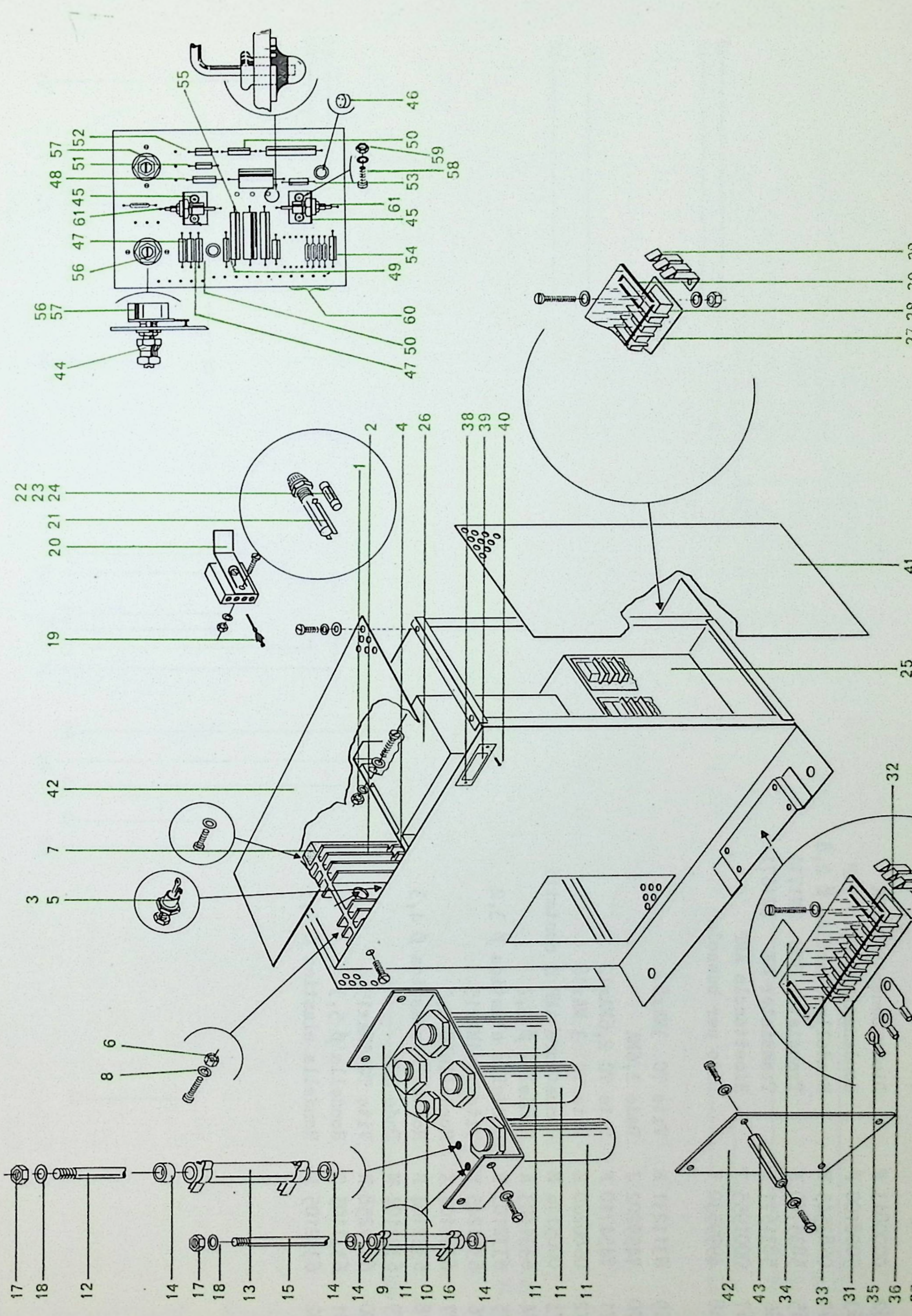
ventilatore (VAR 220) CRZ 105-111-112-120-121

1	0677001 N	Telaio porta pacchi
2	0677018 H	Gancio di arresto
3	0677257 B	Stud
4	0677014 G	Ferma filtro
5	0677002 S	Piastra supporto ventilatori
6	0001316 E	Ventilatori 230V - 50÷60 Hz
7	0001108 M	Passacavo
8	0001853 G	Passacavo
9	0000867 H	Piastrina numerata per Rhodex K 605/A
10	5612540 D	Morsettiera Rhodex K 605/A
11	0839653 U	Molletta
12	0839356 K	Piastrina isolante
13	0839725 L	Targhetta autoadesiva H4
14	0839726 Y	Targhetta autoadesiva H3
15	0839727 U	Targhetta autoadesiva H2
16	0839728 R	Targhetta autoadesiva H1
17	0834397 W	Targhetta unità elementare
18	0834416 U	Etichetta codice
19	0000677 J	Occhiello 2x4
20	5613350 W	Capocorda
21	5613335 W	Capocorda
22	5613333 D	Capocorda
23	0831766 S	Targhetta
24	5618054 V	Fermacavo Looping tipo 2
25	0001481 J	Filtro completo
26	6311242 W	Vite TC 4MAx8
27	6331104 X	Rondella ∅ 4,3
28	6311245 K	Vite TC 4MAx15
29	0682260 E	Dado 4MA ott. nichelato
30	6311234 N	Vite TC 3MAx15
31	6331103 A	Rondella ∅ 3,2
32	6332103 N	Rondella elastica ∅ 3,2
33	6321103 H	Dado 3MA
34	0683081 S	Rondella elast. ∅ 4,3
35	0682456 Y	Rondella ∅ 4,3



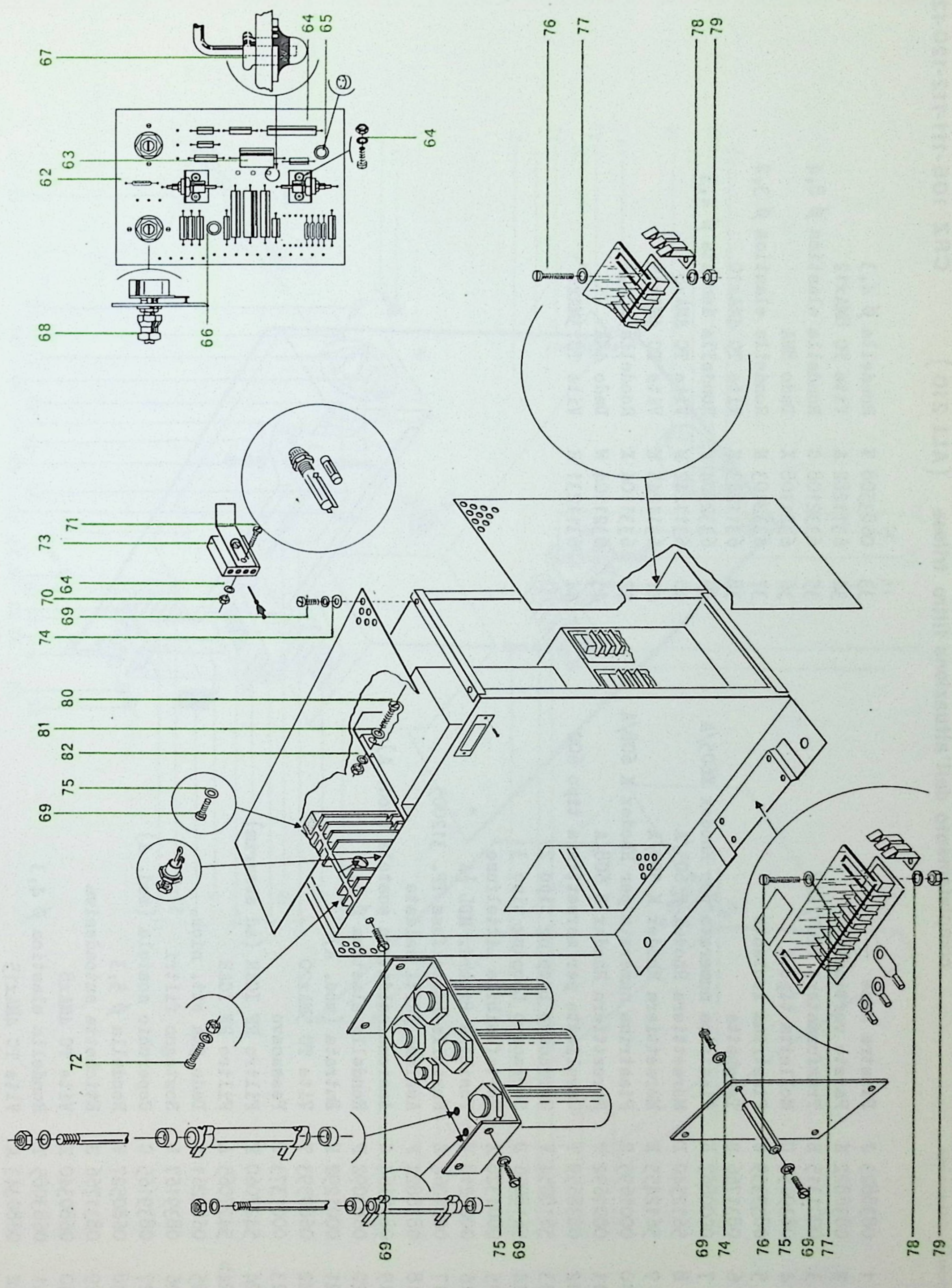
alimentatore per lampada (ALI 220) CRZ 105-111-112-120-121

1	6321105	F	Dado 5MA
2	0842150	L	Dissipatore 1 con diodi
3	0001710	G	Diodo controllato 2N683
4	0842151	M	Dissipatore 2 con diodi
5	0001710	G	Diodo controllato 2N683
6	0682160	C	Dado 3MA ottone
7	0839044	M	Isolante per dissipatori
8	0683066	V	Rondella elastica ⌀ 3,2
–	0842152	Z	AG. Supporto condensatori completo
9	0839041	Q	Supporto condensatori
10	5042400	K	Condensatore 1000 µF 50 VL
11	5038660	S	Condensatore 5000 µF 50 VL
12	0839078	R	Tirante 4x85
13	4972755	V	Resistenza 51Ω 25W 10%
14	0002118	F	Dischetto isolante
15	0839075	L	Tirante 4x70
16	4974076	X	Resistenza 1KΩ 15W 10%
17	6321104	W	Dado 4MA
18	6332304	F	Rondella ⌀ 4,3
19	0001866	E	Pin maschio AMP
20	0689526	L	Piastrina fissaggio connettore
21	0001238	K	Portafusibile
22	0001251	X	Fusibile 5A
23	0001255	U	Fusibile 15A
24	0001258	Z	Fusibile ½A
25	0001712	M	Trasformatore
26	0001711	N	Induttanza 10 mH - 13A
27	0001799	K	Piastrina numerata per Rhodex K 604/A
28	0001798	P	Morsettiera Rhodex K 604/A
29	0839653	U	Molletta tipo A
30	0839355	F	Piastrina isolante per Rhodex K 604/A
31	5612988	H	Piastrina numerata per Rhodex K 607/A
32	5612543	N	Morsettiera Rhodex K 607/A
33	0839358	C	Piastrina isolante per Rhodex K 607/A
34	0831766	S	Targhetta
35	5613333	D	Capocorda
36	5613350	W	Capocorda
37	5613329	W	Capocorda
38	0834397	W	Targhetta unità elementare
39	0834416	U	Etichetta codice
40	0000647	J	Occhiello 2x4
41	0839039	R	Fiancata
42	0839045	R	Coperchio
43	0838721	P	Distanziatore
–	0620258	R	AG. Piastrina LATE 15
44	4995550	X	Bussola per bloccaggio potenz.
45	0833438	S	Dissipatore per diodi
46	0839831	F	Distanziatore per transistor
47	4922050	Z	Resistenza 10 Ω
48	4924290	R	Resistenza 1,8 KΩ
49	4923530	U	Resistenza 330 Ω
50	4923050	V	Resistenza 100 Ω
51	4933766	A	Resistenza 560 Ω 2%
52	4933926	T	Resistenza 820 Ω 2%
53	4924690	Z	Resistenza 4,7 KΩ
54	4924532	W	Resistenza 3,3 KΩ
55	0001824	S	Resistenza 18 KΩ 10%
56	0001709	N	Potenziometro 10 KΩ 10%
57	4991375	W	Potenziometro 1 KΩ 10%
58	0680115	U	Vite TC 2,6MAx8
59	0682080	V	Dado 2,6MA
60	5822840	J	Diodo 1N 4004
61	5826515	T	Diodo Zener ZL22 22V 5W



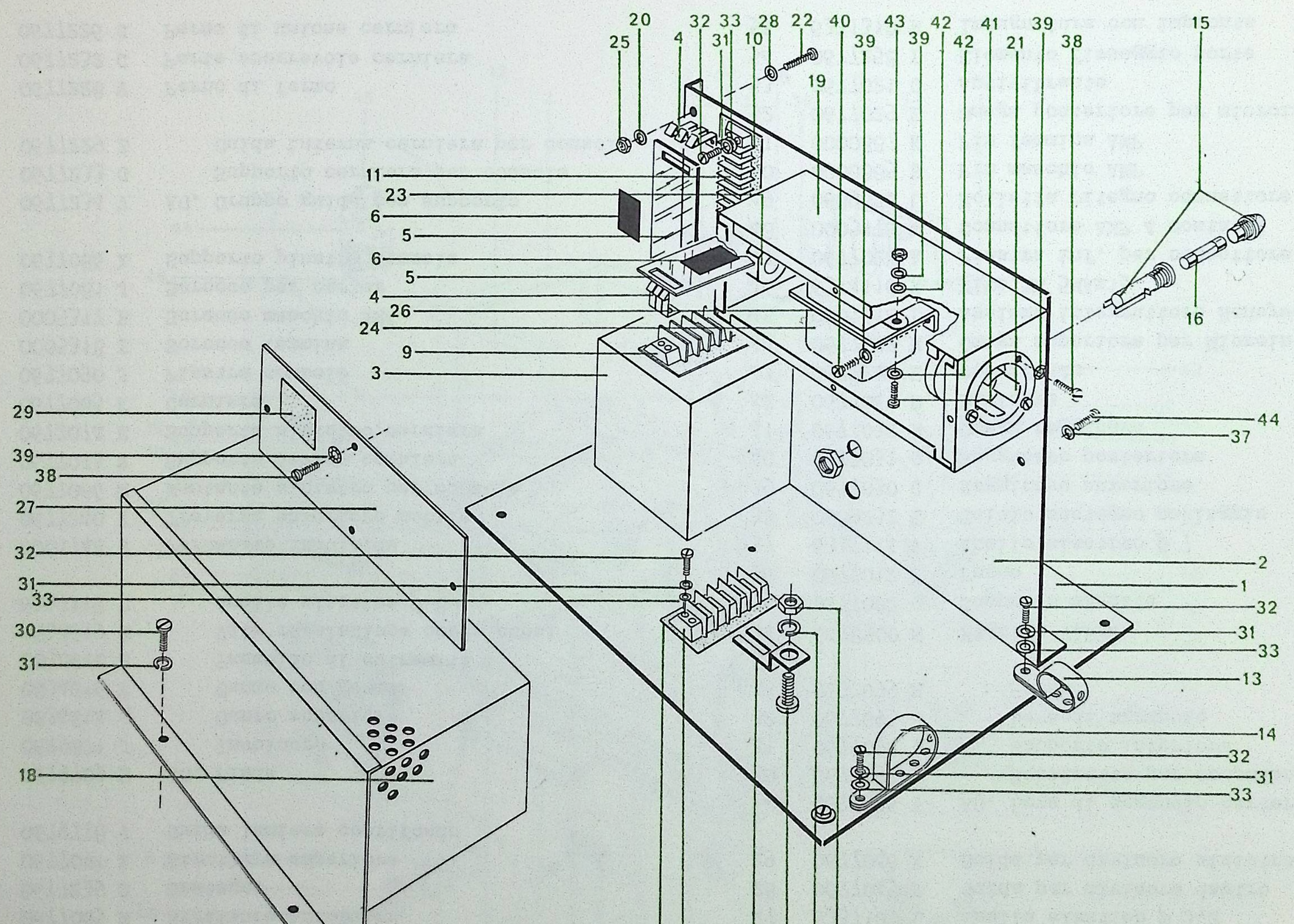
62	0000843 F	Diodo Zener 1S2075A
63	5008100 F	Condensatore 0,68 μF
64	0683545 R	Rondella elastica ø 2,8
65	5835750 N	Transistor SGS 2N1711
66	5831671 N	Transistor GE 2N1671
67	0001955 T	Ricettacolo AMP
68	4999530 V	Dado per bussola

69	6311231 R	Vite TC 3MAx8
70	7459202 J	Dado 2,6MA
71	7454710 F	Vite TC 2,6MAx12
72	0680260 Z	Vite TC 3 MAx18
73	0005176 M	Connettore AMP 4 contatti
74	6331103 A	Rondella ø 3,2
75	6332103 N	Rondella elastica ø 3,2
76	6311245 K	Vite TC 4MAx15
77	6331104 X	Rondella ø 4,3
78	6332104 B	Rondella elastica ø 4,3
79	6321104 W	Dado 4MA
80	6311258 R	Vite TC 5MAx15
81	6331105 T	Rondella ø 5,3
82	6332105 F	Rondella elastica ø 5,3



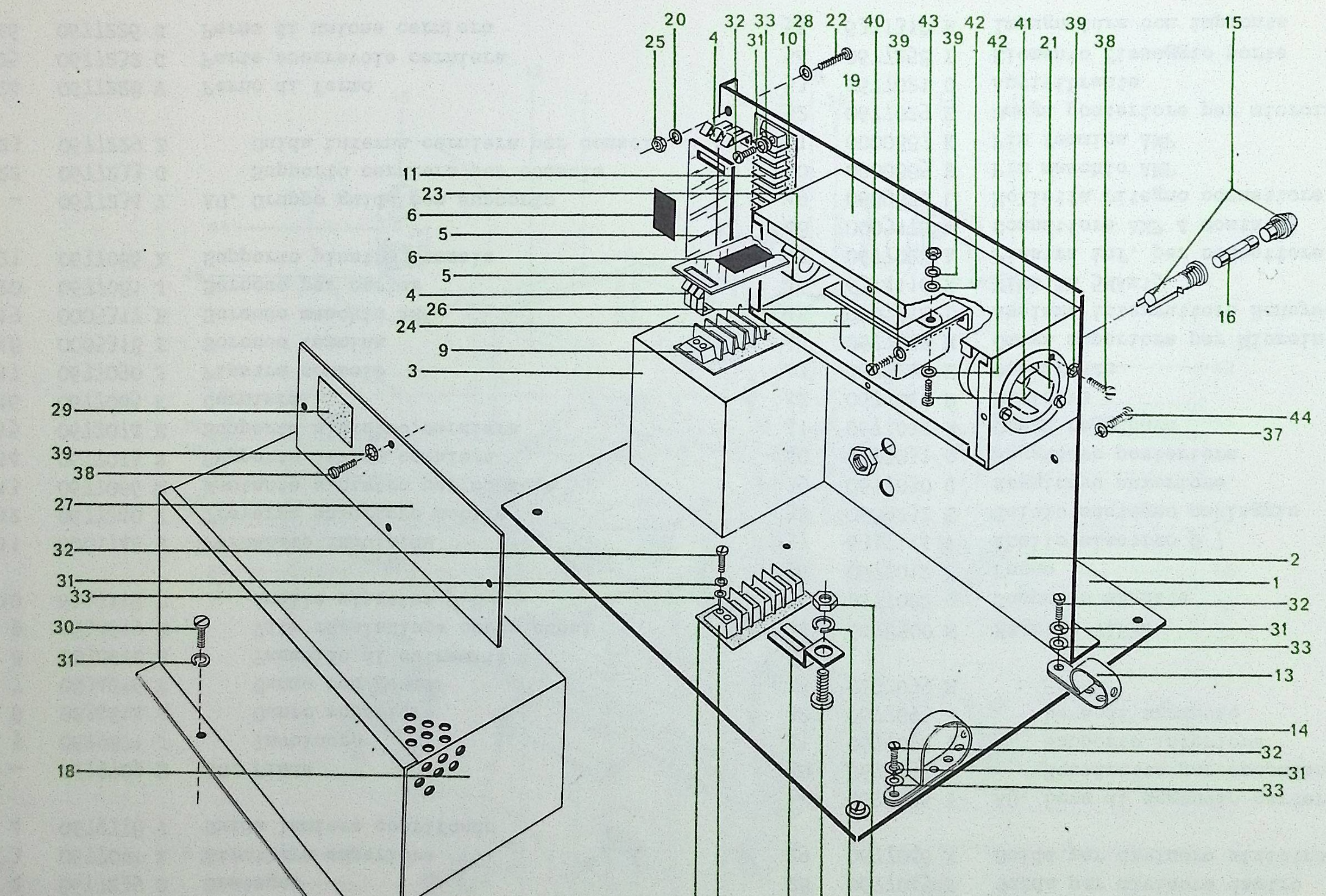
completamento dell'attuazione filtro trifase (ALI 210) CRZ 105-111-112-120-121

1	0838823 J	Piastra Base
2	0838822 N	Parete verticale
3	0001315 S	Trasformatore 220V/24V
4	0839653 U	Molletta tipo A
5	0839359 C	Piastrina isolante
6	0831766 S	Targhetta
7	0000867 H	Piastrina numerata per Rhodex K605/A
8	5612540 D	Morsettiera Rhodex K 605/A
9	5612455 E	Morsettiera Rhodex K 509/A
10	0001695 R	Piastrina numerata per Rhodex K 608/A
11	0001692 T	Morsettiera Rhodex K 608/A
12	0838659 T	Cavalletto per morsettiera tipo 600
13	5618054 V	Serracavo Looping tipo 2
14	5618056 D	Serracavo Looping tipo 3
15	0001328 X	Portafusibile Littelfuse
16	0001218 V	Fusibile ritard. MDL ½A
17	0001264 Z	Fusibile Littelfuse TP. 312005
18	0838824 F	Assieme parti saldate
19	0839164 G	Assieme saldatura scatola (mod. A)
20	0683092 F	Rondella elastica ∅ 5,3
21	0001292 K	Entrata (mod. A)
22	0680593 T	Vite TC 5MAx20
23	0001373 F	Passacavo
24	5427060 F	Filtro RF ICAR (ad esaurim)
24b	5427065 A	Filtro RF ICAR
25	0682261 F	Dado 5MA ott. nich.
26	0839167 L	Sostegno filtri
27	0839165 C	Coperchio scatola (mod. A)
28	0680527 V	Rondella ∅ 5,3
29	0831766 S	Etichetta autoadesiva
30	0680340 Z	Vite TC 4MAx8
31	0683085 T	Rondella elastica ∅ 4,3
32	0680343 A	Vite TC 4MAx15
33	0683508 V	Rondella ∅ 4,3
34	6311282 A	Vite TC 8MAx12
35	6332108 C	Rondella elastica ∅ 8,4
36	6321108 X	Dado 8MA
37	6332103 N	Rondella elastica ∅ 3,2
38	6311243 S	Vite TC 4MAx10
39	6332304 F	Rondella dentata ∅ 4,3
40	6311242 W	Vite TC 4MAx8
41	6311245 K	Vite TC 4MAx15
42	6331104 X	Rondella ∅ 4,3
43	6321104 W	Dado 4MA
44	6311231 R	Vite TC 3MAx8



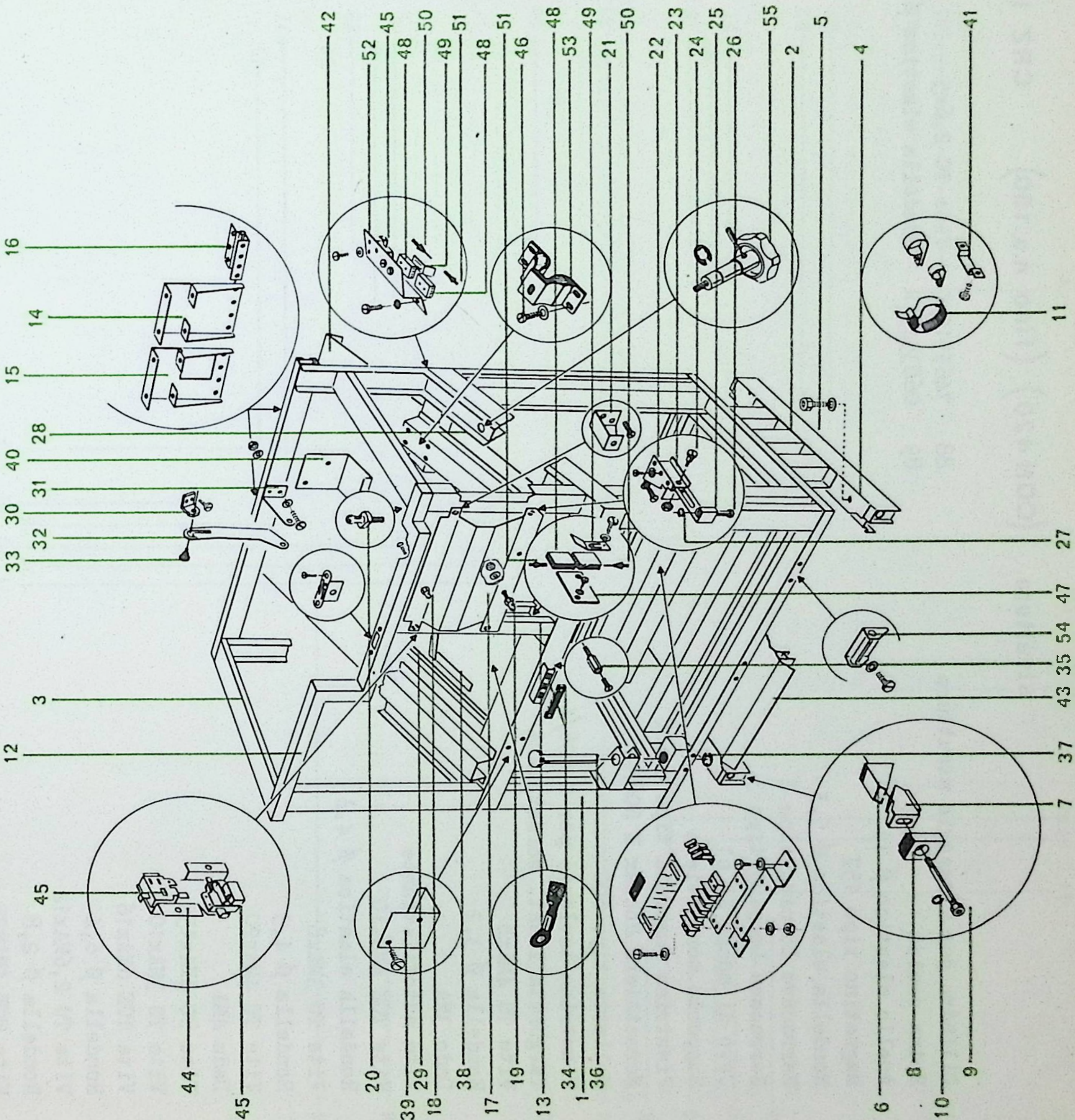
completamento dell'attuazione filtro trifa[illegible] (ALI 210) CRZ 105-111-112-120-121

1	0838823 J	Piastra Base
2	0838822 N	Parete verticale
3	0001315 S	Trasformatore 220V/24V
4	0839653 U	Molletta tipo A
5	0839359 C	Piastrina isolante
6	0831766 S	Targhetta
7	0000867 H	Piastrina numerata per Rhodex K605/A
8	5612540 D	Morsettiera Rhodex K 605/A
9	5612455 E	Morsettiera Rhodex K 509/A
10	0001695 R	Piastrina numerata per Rhodex K 608/A
11	0001692 T	Morsettiera Rhodex K 608/A
12	0838659 T	Cavalletto per morsettiera tipo 600
13	5618054 V	Serracavo Looping tipo 2
14	5618056 D	Serracavo Looping tipo 3
15	0001328 X	Portafusibile Littelfuse
16	0001218 V	Fusibile ritard. MDL $\frac{1}{2}$A
17	0001264 Z	Fusibile Littelfuse TP. 312005
18	0838824 F	Assieme parti saldate
19	0839164 G	Assieme saldatura scatola (mod. A)
20	0683092 F	Rondella elastica Ø 5,3
21	0001292 K	Entrata (mod. A)
22	0680593 T	Vite TC 5MAx20
23	0001373 F	Passacavo
24	5427060 F	Filtro RF ICAR (ad esaurim)
24b	5427065 A	Filtro RF ICAR
25	0682261 F	Dado 5MA ott. nich.
26	0839167 L	Sostegno filtri
27	0839165 C	Coperchio scatola (mod. A)
28	0680527 V	Rondella Ø 5,3
29	0831766 S	Etichetta autoadesiva
30	0680340 Z	Vite TC 4MAx8
31	0683085 T	Rondella elastica Ø 4,3
32	0680343 A	Vite TC 4MAx15
33	0683508 V	Rondella Ø 4,3
34	6311282 A	Vite TC 8MAx12
35	6332108 C	Rondella elastica Ø 8,4
36	6321108 X	Dado 8MA
37	6332103 N	Rondella elastica Ø 3,2
38	6311243 S	Vite TC 4MAx10
39	6332304 F	Rondella dentata Ø 4,3
40	6311242 W	Vite TC 4MAx8
41	6311245 K	Vite TC 4MAx15
42	6331104 X	Rondella Ø 4,3
43	6321104 W	Dado 4MA
44	6311231 R	Vite TC 3MAx8

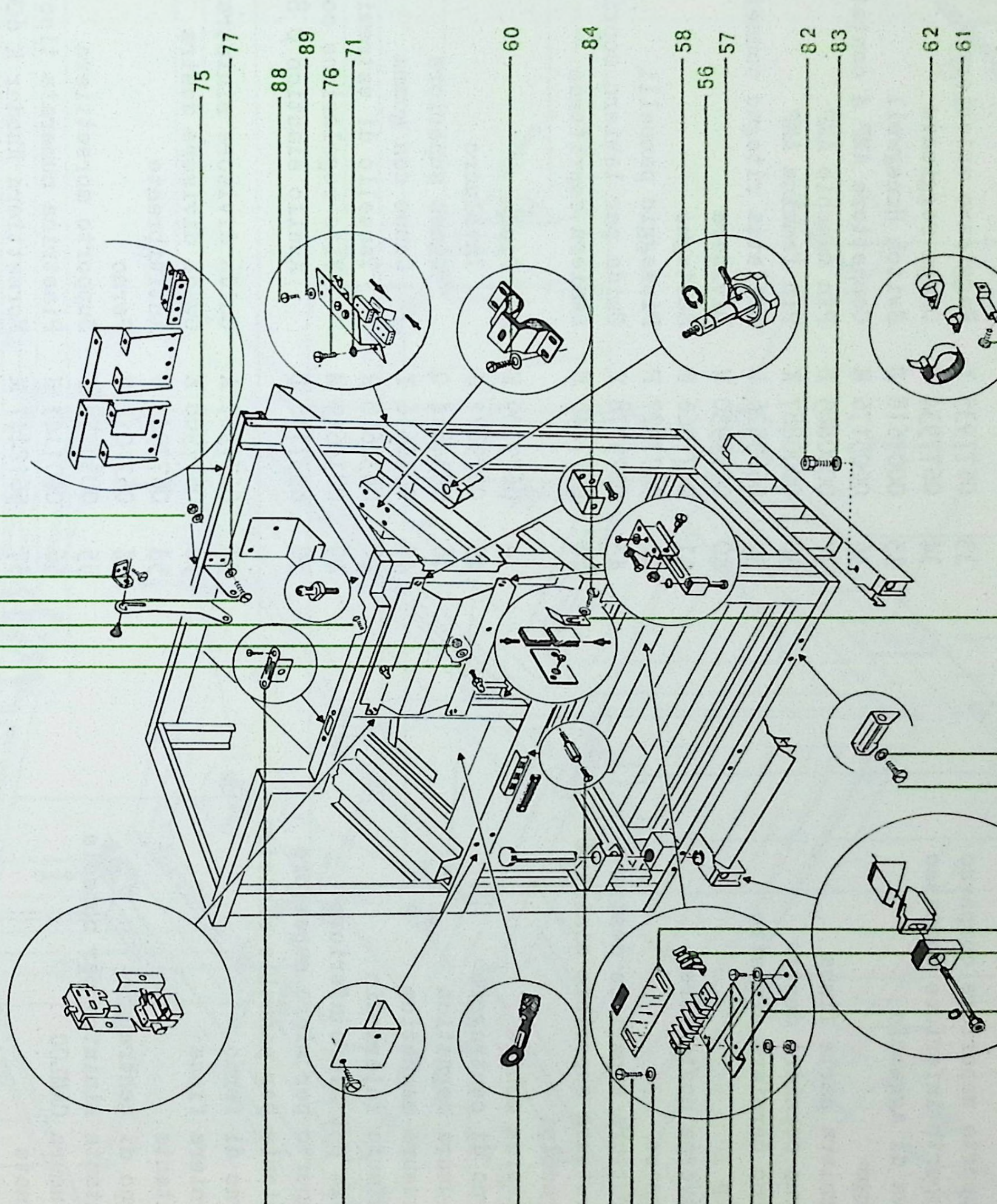


struttura (CON 420) (fino n.s. 160) CRZ 105-111-112-120-121

1	0677065 H	Struttura inferiore
2	0677239 S	Sostegno
3	0677091 K	Struttura superiore
4	0679778 V	Guida lamiera coprifondo
-	0679709 E	AG. Piede
5	0679871 J	Involucro
6	0834614 Q	Cuneo superiore
7	0834616 Y	Cuneo con gomma
8	0834618 R	Tassello di estremità
9	0834619 M	Vite regolazione corsa cunei
10	6337116 D	Anello elastico Ø 8
11	0001744 H	Fermacavo insuloide
12	0677240 Y	Traversa anteriore mobile
13	0677066 M	Montante sinistro per console
14	0677073 R	Supporto destro cerniera
15	0677074 E	Supporto sinistro cerniera
16	0677085 K	Cerniera
17	0677090 J	Piastra console
18	0005318 Y	Scrocco femmina
19	0005317 B	Scrocco maschio 4MA
20	0677081 J	Scrocco per carter
21	0677086 X	Supporto piastra console
-	0677234 V	AG. Gruppo guida con supporto
22	0677233 G	Supporto cerniera per console
23	0677229 Z	Guida interna cerniera per console
24	0677228 V	Perno di fermo
25	0677232 C	Parte scorrevole cerniera
26	0677226 C	Perno di unione cerniera
27	6337107 L	Anello elastico Ø 3,2
28	0677045 F	Guida per divisore destro
29	0677046 K	Guida per divisore sinistro
-	0677096 Y	AG. Leva di aggancio carter centrale
30	0677093 T	Squadretta per compasso
31	0677094 Q	Supporto inferiore
32	0677095 L	Leva di aggancio
33	0677099 M	Perno
34	6478500 M	Magnete VAREC
35	0677022 Q	Supporto magnete
36	0677012 P	Perno
37	6337114 V	Anello elastico Ø 7
38	0689232 E	Telaio sostegno cablaggio
39	0677030 C	Reggicavo anteriore
40	0677031 Q	Reggicavo posteriore
41	0677032 R	Omega reggicavo
42	0677047 P	Divisore
43	0677246 E	Coprifondo
44	0677027 M	Omega superiore per Microinterruttore
45	0001618 D	Assieme interruttore Honeywell
46	6314116 X	Vite TE 5MAx15
47	0677028 A	Piastra inf. per connettore
48	0005176 M	Connettore AMP 4 contatti
49	0689526 L	Molletta ritegno connettore
50	0000885 B	Pin maschio AMP
51	0000887 K	Pin femmina AMP
52	0677029 E	Omega posteriore per microinterruttore
53	0677021 C	Antivibrante
54	0677258 Y	Elemento fissaggio porte
55	6371310 N	Impugnatura con impronte

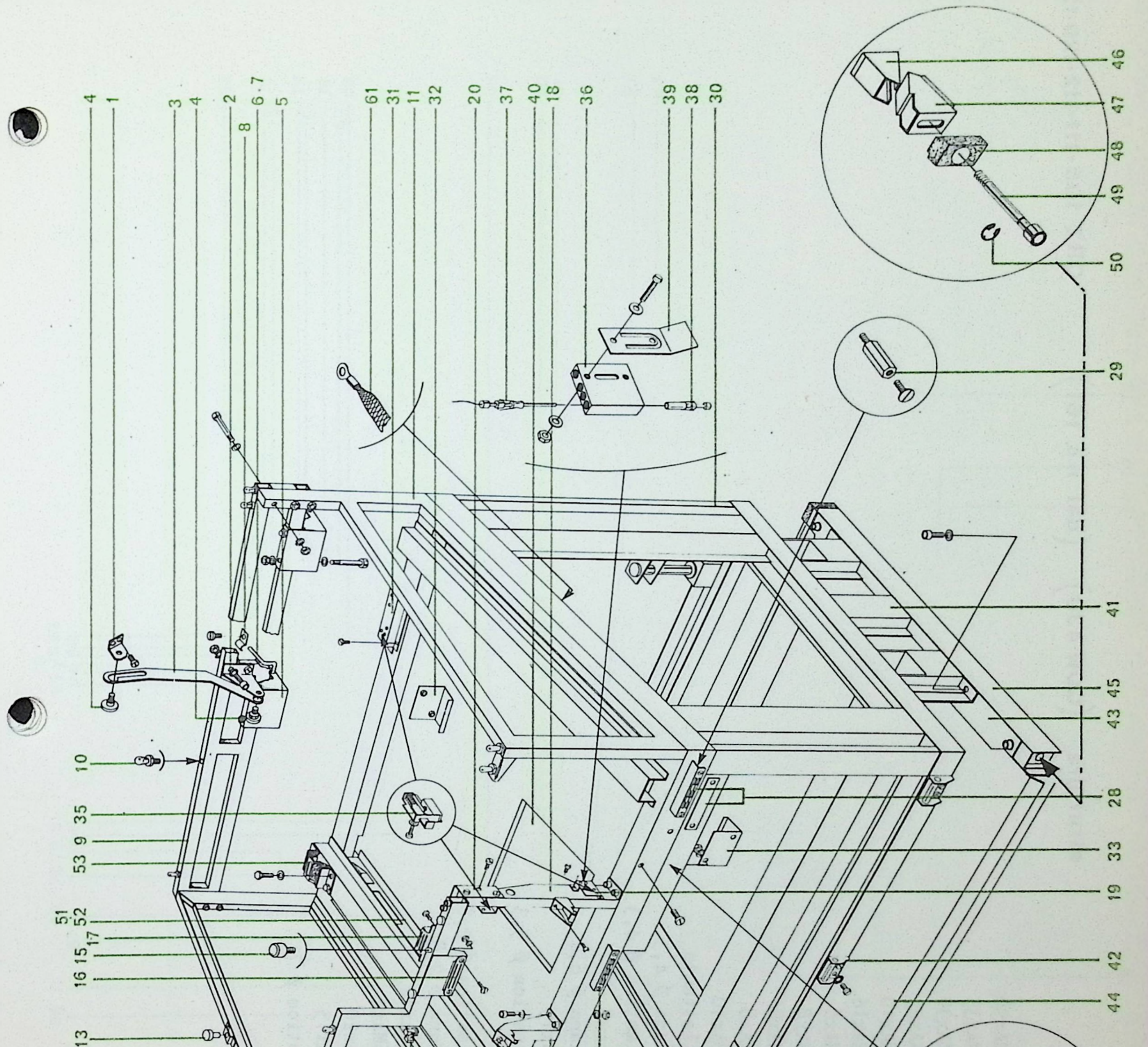


56	0677033	M	Cilindro per fissaggio strutture
57	6342139	Y	Spina conica
58	6337129	T	Anello elastico Ø 15
59	0005314	X	Magnetino tipo 157
60	6332105	F	Rondella elastica Ø 5,3
61	5618054	V	Serracavo Looping tipo 2
62	5618056	D	Serracavo Looping tipo 3
63	0641929	L	Cavo di massa AL 61
64	0838458	J	Supporto morsettiera
65	0001147	H	Piastrina numerata tipo 0-600
66	5612447	M	Morsettiera Rhodex K 606/A
67	0839653	U	Molletta tipo 600
68	0839357	P	Piastrina isolante per K 606/A
69	0831089	U	Targhetta ident. morsettiera
70	6312743	Q	Vite TS 4MAx8
71	6331103	A	Rondella Ø 3,2
72	6321103	H	Dado 3MA
73	1925544	P	Vite autofilettante
74	6313115	W	Vite TCE 4MAx10
75	6332104	B	Rondella elastica Ø 4,3
76	6311231	R	Vite TC 3MAx8
77	6331104	X	Rondella Ø 4,3
78	6311247	T	Vite TC 4MAx20
79	6321104	W	Dado 4MA
80	6311245	K	Vite TC 4MAx15
81	6312734	C	Vite TS 3MAx10
82	6313148	W	Vite TCE 6MAx16
83	6331106	F	Rondella Ø 6,4
84	0680125	V	Vite TC 2,6MAx12
85	0683503	F	Rondella Ø 2,8
86	6313120	V	Vite TCE 4MAx25
87	6311242	W	Vite TC 4MAx8
88	7465510	G	Vite TC 2,6x5
89	0683545	R	Rondella elastica Ø 2,8



struttura (CON 430) (dal n.s. 161) CRZ 105 111 112 120 121

1	0677093 J	Supporto superiore compasso
2	0677870 V	Supporto inferiore compasso
3	0677095 L	Leva di aggancio
4	0677099 M	Perno
5	0677957 A	Cerniera parte fissa
6	0677674 H	Perno cerniera destro
7	0677958 X	Perno cerniera sinistro
8	0005351 W	Clip
9	0677863 G	Traversa posteriore
10	0677756 R	Scrocco
11	0677844 T	Struttura superiore destra
12	0677854 U	Struttura superiore sinistra
13	0677842 A	Paracolpi
14	0677837 E	Traversa mobile
15	0677843 E	Perno di centraggio
16	0005314 X	Chiusura magnetica
17	0005135 G	Chiusura magnetica
18	0677872 D	Montante intermedio
19	0677877 A	Omega per micro inferiore
20	0677878 X	Supporto per micro superiore
21	0677940 X	Montante per pannello sinistro
22	0677941 Y	Perno di fermo
23	0677868 W	Cerniera fissa
24	0677938 V	Montante
25	0677697 X	Perno di centraggio
26	0677923 E	Montante sinistro per console
27	0005352 A	Chiusura CAMLOC
28	0005315 T	Magnete
29	0677022 Q	Distanziatore
30	0677884 F	Telaio
31	0677907 R	Omega posteriore per micro
32	0677942 C	Reggicavo posteriore
33	0677935 Y	Reggicavo anteriore
34	0677934 U	Omega reggicavo
35	0001618 D	Switch Honeywell
36	0005176 M	Connettore AMP 4 contatti
37	0000885 B	Pin maschio AMP
38	0000887 K	Pin femmina AMP
39	0689526 L	Molletta ritegno connettore
40	0677930 W	Divisore
41	0677966 F	Sostegno
42	0677927 F	Fissaggio pannelli
43	0679778 V	Guida per lamiera coprifondo
44	0677246 E	Lamiera coprifondo
-	0679709 E	AG. Piede
45	0679871 J	Involucro
46	0834614 Q	Cuneo superiore
47	0834616 Y	Cuneo con gomma
48	0834618 R	Tassello di estremità
49	0834619 M	Vite regolazione corsa cunei
50	6337116 D	Anello elastico ∅ 8
51	0677909 A	Guida divisore sinistra
52	0677908 E	Guida divisore destra
53	0677944 V	Antivibrante
54	0677012 P	Perno
55	0838458 J	Supporto morsettiera
56	0001147 H	Piastrina numerata tipo 0-600
57	5612447 M	Morsettiera Rhodex K 606/A
58	0839653 U	Molletta tipo 600
59	0839357 P	Piastrina isolante per K 606/A
60	0831089 U	Targhetta identificazione morsettiera
61	0641929 L	Cavo di massa AL 61



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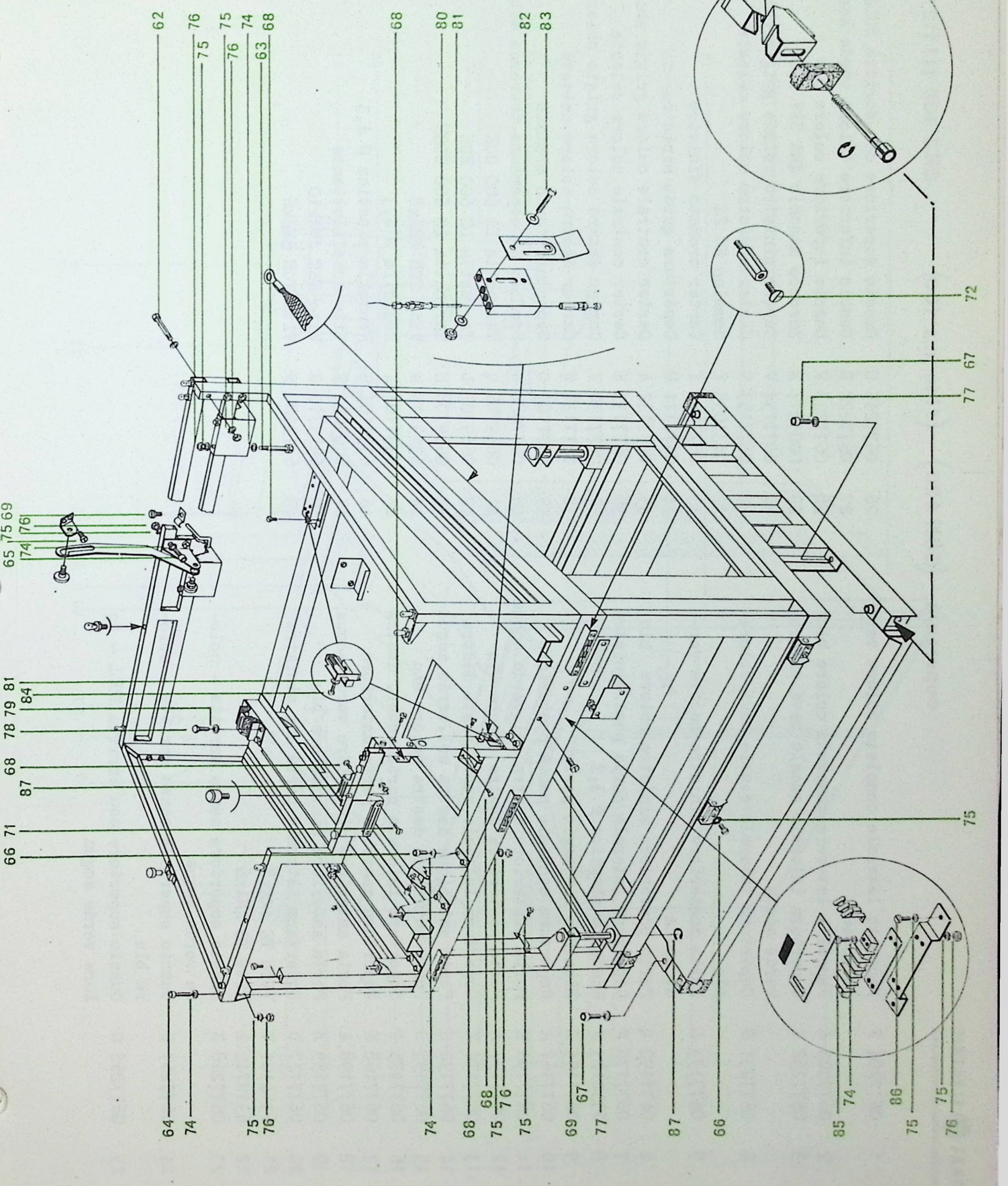
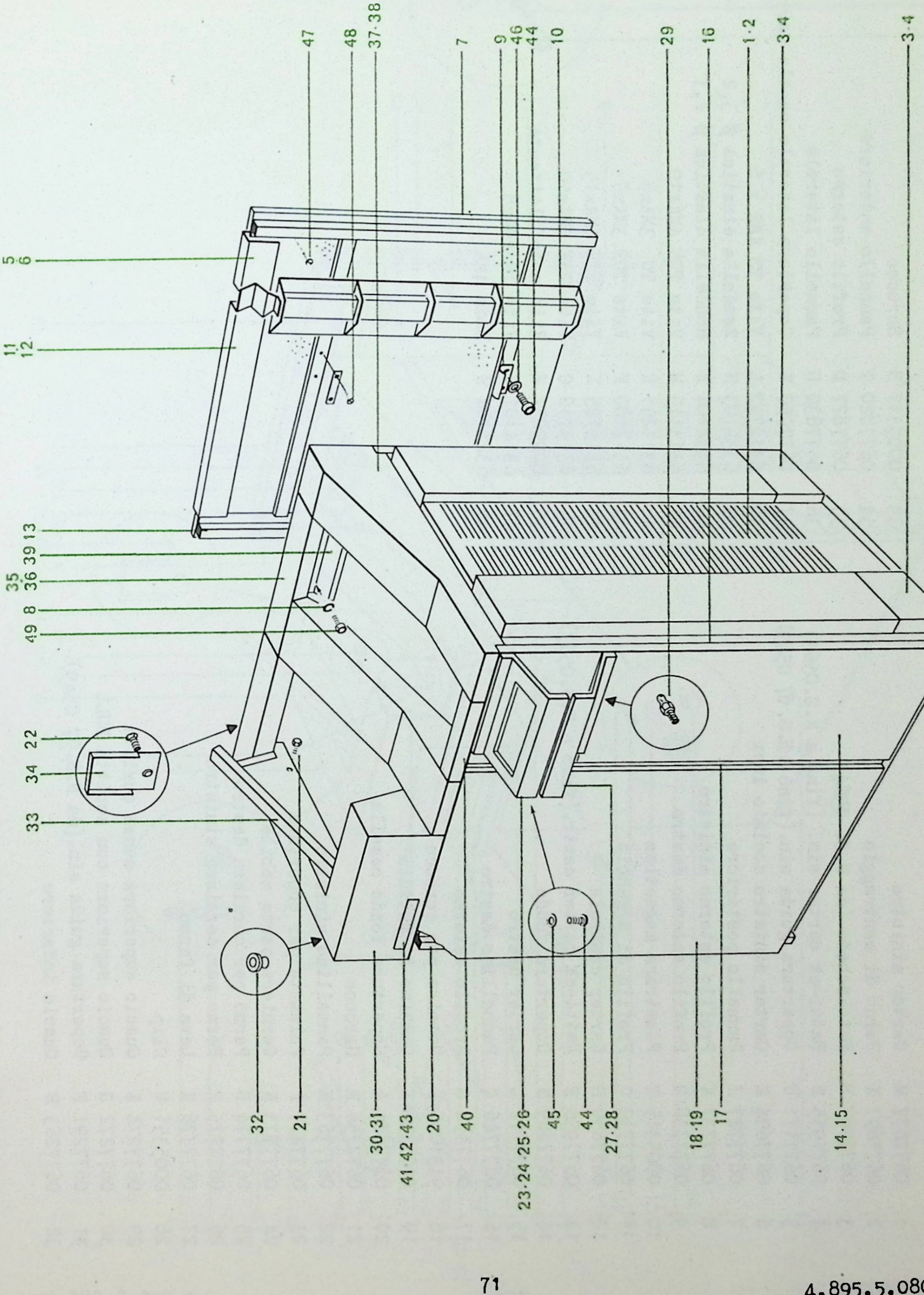
62	6313125 X	Vite TCE 4MAx50
63	6313122 A	Vite TCE 4MAx35
64	6313121 W	Vite TCE 4MAx30
65	6313120 V	Vite TCE 4MAx25
66	6313115 W	Vite TCE 4MAx10
67	6313148 W	Vite TCE 6MAx16
68	6311230 Q	Vite TC 3MAx6
69	6311231 R	Vite TC 3MAx8
70	6311242 W	Vite TC 4MAx8
71	6312733 P	Vite TS 3MAx8
72	6312734 C	Vite TS 3MAx10
73	1925544 P	Vite autofilettante
74	6331104 X	Rondella piana ∅ 4,3
75	6332104 B	Rondella elastica ∅ 4,3
76	6321104 W	Dado 4MA
77	6331106 F	Rondella piana ∅ 6,4
78	6314116 X	Vite TE 5MAx15
79	6332105 F	Rondella elastica ∅ 5,3
80	0682080 V	Dado 2,6MA
81	0683545 R	Rondella elastica ∅ 2,8
82	0683503 F	Rondella piana ∅ 2,8
83	0680125 V	Vite TC 2,6MAx12
84	7465510 G	Vite TC 2,6MAx4
85	6311247 T	Vite TC 4MAx20
86	6311245 K	Vite TC 4MAx15
87	6337114 V	Anello elastico ∅ 7



1	0677204 F	Pannello laterale completo colore verde acqua
2	0677205 A	Pannello laterale completo colore blu
3	0677252 E	Copertura laterale canale cavi colore verde acqua
4	0677251 S	Copertura laterale canale cavi colore blu
5	0677193 L	Porta posteriore sinistra colore verde acqua
6	0677192 Q	Porta posteriore sinistra colore blu
7	0677176 F	Copertura laterale porta post.sinistra
8	6332103 N	Rondella elastica Ø 3,2
9	0677155 Z	Elemento fissaggio porte
10	0677167 A	Copertura centrale porta posteriore
11	0677196 R	Porta posteriore destra col.verde acqua
12	0677197 M	Porta posteriore destra colore blu
13	0677174 X	Copertura laterale porta post. destra
14	0677194 H	Porta anteriore destra col.verde acqua
15	0677195 D	Porta anteriore destra colore blu
16	0677175 T	Copertura laterale porta anter. destra
17	0677168 X	Copertura centrale porta anteriore
18	0677198 A	Porta anteriore sin.colore verde acqua
19	0677199 B	Porta anteriore sin. colore blu
20	0677177 B	Copertura laterale porta ant.sinistra
21	6314101 V	Vite TE 4MAx8
22	6312742 L	Vite TS 4MAx6
23	0677268 Z	Guscio superiore senza scritta - colore verde acqua
24	0677267 C	Guscio superiore senza scritta - colore blu
25	0677266 G	Guscio superiore con scritta BULL - colore verde acqua
26	0677265 U	Guscio superiore con scritta BULL col.blu
27	0677222 B	Guscio inferiore colore verde acqua
28	0677223 F	Guscio inferiore colore blu
29	0005317 B	Scrocco maschio 4MA SBV 1701
30	0677154 V	Carter sinistro colore grigio chiaro
31	0677153 G	Carter sinistro colore celeste
32	9431035 Y	Gommino MC 24
33	0677151 Y	Carter cromato sinistro
34	0677111 U	Copertura guida sinistra
35	0677132 A	Carter centrale colore grigio chiaro
36	0677133 E	Carter centrale colore celeste
37	0677130 V	Carter destro colore grigio chiaro
38	0677131 W	Carter destro colore celeste
39	0677107 Q	Copertura fondo cromato
40	0677082 W	Profilo di oopertura traversa mobile
41	0669706 Q	Targhetta LS 600 OGE
42	0669707 L	Targhetta LS 600 BGE
43	0669708 H	Targhetta LS 600 CDGE
44	6313115 W	Vite TCE 4MAx8
45	6331104 X	Rondella Ø 4,3
46	6332104 B	Rondella elastica Ø 4,3
47	0005052 M	Vite autofilettante
48	6313710 G	Vite TSE 4MAx10
49	6313100 F	Vite TCE 3MAx6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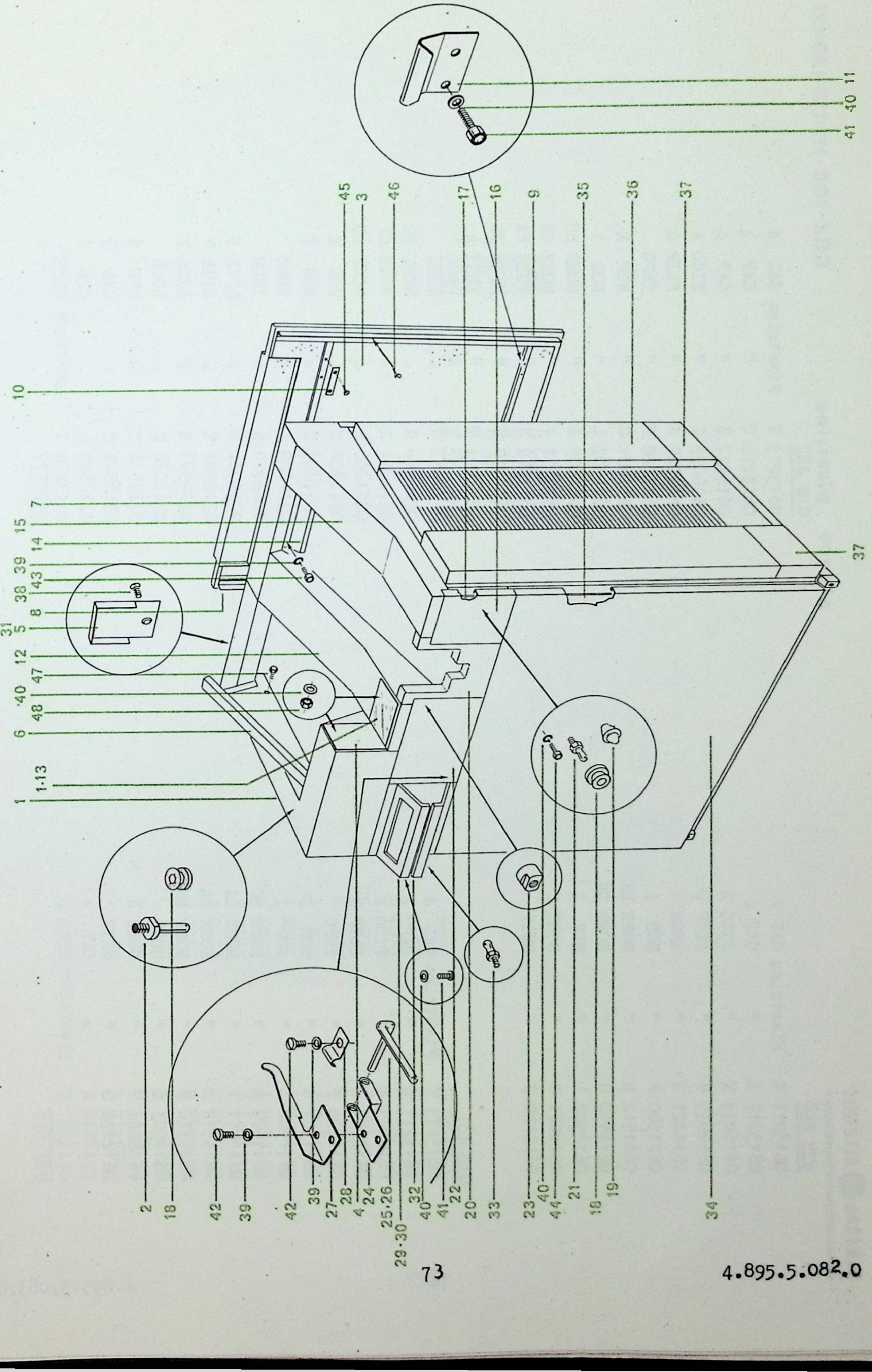
copertura (CON 430) (dal n.s. 161) CRZ 105-111-112-120-121

1	0677677 M	Carter sinistro
2	0677697 X	Perno di centraggio
3	0677967 B	Battischede (da N.S. 0564)
4	0677955 S	Batti-sk carter sin. (fino a N.S.0563)
5	0677111 U	Copertura guida sin.(fino a N.S. 67 C549)
6	0677694 K	Carter sinistro acciaio inox
7	0677727 J	Pannello posteriore
8	0677737 K	Profilo esterno sinistro
9	0677738 G	Profilo esterno destro
10	0005315 T	Piastrina magnetica
11	0677739 C	Profilo di aggancio
12	0677650 H	Carter centrale
13	0677956 E	Batti-sk carter centr.(fino a N.S.0563)
14	0677869 S	Copertura fondo
15	0677712 L	Carter destro
16	0677746 Q	Pannellino destro
17	0677752 G	Profilo esterno
18	9431035 Y	Gommino per scrocco
19	0005338 S	Gommino di battuta
20	0677881 A	Copertura fondo casella
21	0677756 R	Scrocco
22	0677763 M	Pannellino sinistro
23	0677777 P	Pulsante per copertura
24	0677773 N	Cerniera parte mobile
25	0677774 B	Perno per cerniera destro
26	0677775 F	Perno per cerniera sinistro
27	0677776 K	Leva di fermo
28	0005351 W	Clip
29	0677274 Z	Guscio superiore senza scritta
30	0677272 G	Guscio superiore con scritta BULL
31	0677291 E	Copertura guida sin.(da N.S.67 C549)
32	0677263 B	Guscio inferiore
33	0005317 B	Scrocco
34	0677820 T	Pannello anteriore
35	0677827 D	Profilo esterno
36	0677830 U	Pannello laterale
37	0677950 Y	Copertura laterale canale cavi
38	6312742 L	Vite TS 4MA x 6
39	6332103 N	Rondella elastica ∅ 3,2
40	6332104 B	Rondella elastica ∅ 4,3
41	6313115 W	Vite TCE 4MAx10
42	6311231 R	Vite TC 3MAx8
43	6313100 F	Vite TCE 3MAx6
44	6313125 X	Vite TCE 4MAx15
45	6313710 G	Vite TSE 4MAx10
46	0005052 M	Vite autofilettante
47	6314101 V	Vite TE 4MAx8
48	6321104 W	Dado 4MA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GIS 450

0615211 Q	Piastrina	CAP 2
0615217 Z	"	CAP 4
0616033 K	"	FICO A
0612039 C	"	FLIP D
0611421 U	"	INCA
0611500 F	"	NOR A
0611512 H	"	NORR DA
0611510 U	"	NORR DS
0611502 L	"	NOR I
0618021 T	"	SUSI A
0612130 S	"	UNIV

GIS 481

0615213 Y	Piastrina	CAL 4
0615217 Z	"	CAP 4
0616033 K	"	FICO A
0612027 J	"	FLIP A
0611420 T	"	INPO
0611501 G	"	NOR E
0611502 L	"	NOR I
0611509 A	"	NORR BO
0611511 V	"	NORR CA
0611512 H	"	NORR DA
0611510 U	"	NORR DS
0611503 Q	"	NORS
0618021 T	"	SUSI A
0612130 S	"	UNIV

GIS 482

0615213 Y	Piastrina	CAL 4
0615212 U	"	CAP 3
0615217 Z	"	CAP 4
0616033 K	"	FICO A
0612027 J	"	FLIP A
0611420 F	"	INPO
0611501 G	"	NOR E
0611502 L	"	NOR I
0611509 A	"	NORR BO
0611511 V	"	NORR CA
0611512 H	"	NORR DA
0611510 U	"	NORR DS
0618021 T	"	SUSI A
0612130 S	"	UNIV

ATA 210

0617311 S	Piastrina	ALAM B
0615210 P	"	CAP 1
0615212 U	"	CAP 3
0615217 Z	"	CAP 4
0617234 X	"	CHEL
0616033 K	"	FICO A
0616038 H	"	FICO C
0612027 J	"	FLIP A
0617316 F	"	LUME 0 A
0617318 Y	"	LURE A
0611500 F	"	NOR A
0611501 G	"	NOR E
0611509 A	"	NORR BO
0615237 T	"	SIMA E
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0612135 U	"	UNRA

ATA 211

0613230 Y	Piastrina	AFOT
0615210 P	"	CAP 1
0615212 U	"	CAP 3
0615217 Z	"	CAP 4
0613235 S	"	COIN
0616033 K	"	FICO A
0612027 J	"	FLIP A
0612021 H	"	FLIP B
0616018 F	"	ICRE
0611420 T	"	IMPO
0611500 F	"	NOR A
0611501 G	"	NOR E
0611509 A	"	NORR BO
0611511 V	"	NORR CA
0611510 U	"	NORR DS
0611503 Q	"	NORS
0615220 Q	"	SIMA A
0617240 S	"	ULUN A
0612130 S	"	UNIV
0612135 U	"	UNRA

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0671214J	4	4
0671214J	10	7
0671214J	12	17
0671214J	22	26
0671214J	34	39
0671214J	38	11

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Codice	Pag.	Rif.
067I556G	4	20
067I72IY	8	10
067700IN	54	1
0677002S	54	5
067701 2P	62	36
067701 2P	66	54
06770I4G	54	4
06770I8H	54	2
067702IC	62	53
0677022Q	62	35
0677022Q	66	29
0677027M	62	44
0677028A	62	47
0677029E	62	52
0677030C	62	39
067703IQ	62	40
0677032R	62	41
0677033M	64	56
0677045E	62	28
0677046K	62	29
0677047P	62	42
0677065H	62	1
0677066M	62	13
0677073R	62	14
0677074E	62	15
067708IJ	62	20
0677082W	70	40
0677085K	62	16
0677086X	62	21
0677090J	62	17
067709IK	62	3
0677093I	62	30
0677093J	66	1
0677094Q	62	31
0677095L	62	32
0677095L	66	3
0677096Y	62	
0677099M	62	33
0677099M	66	4
06771 07Q	70	39
0677111U	70	34
0677111U	72	5
067713 0V	70	37
0677131W	70	38
0677132A	70	35
0677133E	70	36
0677151Y	70	33
0677153G	70	31

Codice	Pag.	Rif.
0677154V	70	30
0677155Z	70	9
0677167A	70	10
0677168X	70	17
0677174X	70	13
0677175T	70	16
0677176F	70	7
0677177B	70	20
0677192Q	70	6
0677193L	70	5
0677194H	70	14
0677195D	70	15
0677196R	70	11
0677197M	70	12
0677198A	70	18
0677199B	70	19
0677204F	70	1
0677205A	70	2
0677214T	44	4
0677215X	44	3
0677222B	70	27
0677223E	70	28
0677225Y	44	6
0677226C	62	26
0677228V	62	24
0677229Z	62	23
0677232C	62	25
0677233G	62	22
0677234V	62	
0677239S	62	2
0677240Y	62	12
0677246E	62	43
0677246E	66	44
0677247A	44	1
0677251S	70	4
0677252E	70	3
0677257B	54	3
0677258Y	62	54
0677263B	72	32
0677265U	70	26
0677266G	70	25
0677267C	70	24
0677268Z	70	23
0677272G	72	30
0677274Z	72	29
0677291E	72	31
0677650H	72	12
0677674H	66	6

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Codice	Pag.	Rif.
0677677M	72	1
0677694K	72	6
0677697X	66	25
0677697X	72	2
0677712L	72	15
0677727J	72	7
0677737K	72	8
0677738G	72	9
0677739C	72	11
0677746Q	72	16
0677752G	72	17
0677756R	66	10
0677756R	72	21
0677763M	72	22
0677773N	72	24
0677774B	72	25
0677775F	72	26
0677776K	72	27
0677777P	72	23
0677790P	44	2
0677813B	46	55
0677820T	72	34
0677827D	72	35
0677830U	72	36
0677837E	66	14
0677842A	66	13
0677843E	66	15
0677844T	66	11
0677854U	66	12
0677863G	66	9
0677868W	66	23
0677869S	72	14
0677870V	66	2
0677872D	66	18
0677877A	66	19
0677878X	66	20
0677881A	72	20
0677884F	66	30
0677907R	66	31
0677908E	66	52
0677909A	66	51
0677923E	66	26
0677927F	66	42
0677930W	66	40
0677934U	66	34
0677935Y	66	33
0677938V	66	24
0677940X	66	21

Codice	Pag.	Rif.
0677941Y	66	22
0677942C	66	32
0677944V	66	53
0677950Y	72	37
0677955S	72	4
0677956E	72	13
0677957A	66	5
0677958X	66	7
0677966F	66	41
0677967B	72	3
0679709E	62	
0679709E	66	
0679778V	62	4
0679778V	66	43
0679871J	62	5
0679871J	66	45
0680012N	50	68
0680012N	52	16
0680115U	56	58
0680125V	64	84
0680125V	68	83
0680220V	50	97
0680220V	52	28
0680260Z	58	72
0680330Y	50	88
0680330Y	52	31
0680340Z	24	33
0680340Z	26	33
0680340Z	60	30
0680341S	50	91
0680343A	50	86
0680343A	60	32
0680402Y	24	27
0680402Y	26	27
0680527V	60	28
0680550E	52	43
0680551F	50	80
0680551F	52	23
0680593T	60	22
0681290D	50	108
0682080V	56	59
0682080V	68	80
0682160C	50	99
0682160C	52	22
0682160C	56	6
0682260F	50	83
0682260F	52	26
0682260E	54	29

Codice	Pag.	Rif.
0682261F	60	25
0682456X	50	102
0682456X	52	24
0682456Y	54	35
0682471L	50	85
0682481V	48	44
0682868A	50	92
0682884K	18	40
0683061Q	50	89
0683066V	50	98
0683066V	52	29
0683066V	56	8
0683081S	6	83
0683081S	50	82
0683081S	54	34
0683085T	50	87
0683085T	60	31
0683086F	50	101
0683086F	52	25
0683092F	60	20
0683130	48	43
0683131F	48	27
0683503F	64	85
0683503F	68	82
0683505Y	2	33
0683505Y	6	79
0683508V	50	81
0683508V	60	33
0683545R	58	64
0683545R	64	89
0683545R	68	81
0683685T	24	34
0683685T	26	34
0688000K	6	85
0688000K	10	64
0688002Y	42	6
0688006Z	8	22
0688007V	8	23
0688010G	8	7
0688012M	8	6
0688013R	8	16
0688014E	8	15
0688015A	8	14
0688016N	8	
0688017J	8	
0688018F	24	43
0688018F	26	43
0688019B	16	3
0688020H	14	79
0688021A	16	
0688023J	4	9
0688023J	10	16
0688025B	10	15
0688026P	10	17
0688028G	4	10
0688029C	4	8
0688032P	8	13
0688035C	8	20
0688042Q	10	65
0688050C	12	15
0688053M	2	49
0688054A	2	47
0688054A	40	61
0688055E	2	46
0688055E	40	63
0688055E	40	64
0688058B	4	30
0688059F	4	23
0688060D	4	24
0688062J	4	26
0688064B	10	42
0688065F	6	63
0688066K	2	52
0688067P	40	59
0688068C	40	57
0688069G	2	43
0688070E	40	66
0688072K	2	45
0688072K	40	58
0688074C	40	60
0688075C	2	44
0688079H	28	35
0688080P	28	34
0688081Q	28	36
0688085R	14	80
0688086V	10	66
0688091R	38	19
0688092J	16	14
0688100C	4	58
0688101D	22	57
0688102R	22	58
0688103M	22	59
0688107N	22	56
0688110Z	22	55
0688111S	18	38
0688111S	28	15

Codice	Pag.	Rif.
0688111S	34	8
0688112E	22	54
0688114X	28	
0688115T	34	
0688117B	22	3
0688125U	4	29
0688134Z	14	82
0688135U	10	67
0688731G	10	63
0688734D	40	40
0688739A	40	39
0688741H	2	7
0688743R	12	14
0688744E	12	13
0688746N	34	55
0688747J	6	69
0688749B	10	32
0688749B	22	14
0688749B	32	19
0688750N	10	40
0688750N	22	13
0688750N	32	21
0688758G	4	29
0688788K	2	42
0688789P	40	56
0688792S	40	55
0689005R	18	1
0689010C	34	5
0689011D	4	37
0689012R	12	57
0689015E	12	58
0689016J	12	59
0689017N	12	6
0689020D	26	
0689022J	26	
0689023N	24	35
0689023N	26	35
0689024B	26	38
0689025F	26	37
0689028C	26	18
0689029G	26	24
0689030E	26	30
0689031F	26	31
0689032K	4	21
0689034C	8	3
0689035G	4	16
0689036L	18	30
0689037Q	18	45

Codice	Pag.	Rif.
0689039H	10	26
0689040F	16	1
0689041G	24	1
0689041G	26	1
0689042L	28	14
0689043Q	40	11
0689045H	40	41
0689046M	40	7
0689047R	24	14
0689047R	26	14
0689050G	18	42
0689055A	18	46
0689056N	2	16
0689062N	4	32
0689065B	10	50
0689066P	8	24
0689067K	4	15
0689067K	10	10
0689068G	10	3
0689069C	10	20
0689070A	10	22
0689072P	12	9
0689073K	12	11
0689076Q	4	31
0689077L	16	4
0689078H	4	50
0689081L	4	48
0689082Y	16	5
0689086Z	4	52
0689086Z	16	26
0689087V	16	9
0689088J	16	25
0689089M	16	15
0689090L	16	16
0689092Z	4	45
0689095N	4	47
0689097W	2	2
0689098K	2	4
0689102M	18	29
0689103R	18	28
0689104E	2	22
0689106N	14	65
0689107J	12	60
0689108F	14	61
0689109B	24	40
0689109B	26	19
0689110V	14	62
0689112A	24	9

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Codice	Pag.	Rif.
0689112A	26	9
0689113E	12	4
0689114T	12	7
0689115X	12	3
0689120W	6	67
0689121X	2	24
0689123F	34	44
0689124U	2	15
0689124U	40	19
0689125V	32	11
0689126C	40	18
0689127G	40	24
0689128V	18	19
0689129Z	10	33
0689129Z	22	19
0689134V	22	43
0689135Z	22	33
0689136D	22	32
0689141Z	18	
0689142D	18	
0689143H	28	
0689166G	34	
0689167C	12	49
0689168Z	22	20
0689168Z	36	61
0689169V	18	15
0689169V	18	21
0689170T	4	38
0689172G	8	1
0689173C	34	51
0689175V	28	21
0689176H	4	46
0689179W	12	37
0689183M	28	7
0689187N	34	2
0689189F	2	11
0689196K	4	56
0689205L	40	31
0689208H	42	1
0689213G	28	28
0689217H	16	6
0689225S	12	21
0689226E	12	20
0689227A	12	
0689229T	4	59
0689232E	42	9
0689232E	62	38
0689234X	28	1
0689236F	10	4
0689241T	34	27
0689244Y	34	45
0689245U	16	
0689251U	12	41
0689253C	24	
0689254Z	24	
0689259W	24	21
0689259W	26	21
0689262H	24	23
0689262H	26	23
0689266A	10	45
0689266A	28	18
0689266A	34	12
0689267E	8	25
0689273E	2	1
0689279Y	10	36
0689283P	4	43
0689286L	12	34
0689288D	4	1
0689292L	10	34
0689294D	10	52
0689298E	4	25
0689301D	4	33
0689302R	42	5
0689305E	10	48
0689306J	10	35
0689308B	22	36
0689310Z	22	2
0689311S	28	29
0689313A	40	6
0689316F	40	5
0689322F	24	
0689322F	26	
0689323B	24	15
0689323B	26	15
0689325U	22	34
0689331U	18	41
0689334Z	42	4
0689338S	12	39
0689347E	10	
0689347E	28	
0689347E	34	
0689358U	4	2
0689361X	4	14
0689365Y	4	13
0689367D	4	7
0689374V	10	9

Codice	Pag.	Rif.
0689375Z	10	12
0689378W	4	12
0689378W	10	13
0689383R	10	11
0689385A	10	19
0689387J	10	21
0689389B	10	1
0689395B	40	13
0689397K	12	48
0689399C	28	27
0689400N	10	38
0689406U	22	18
0689407Y	22	22
0689409R	36	60
0689455H	24	17
0689455H	26	17
0689458E	24	36
0689458E	26	36
0689459A	24	6
0689459A	26	6
0689460G	24	4
0689460G	26	4
0689461H	24	3
0689461H	26	3
0689462M	24	2
0689462M	26	2
0689466N	24	5
0689466N	26	5
0689478G	8	19
0689479C	8	12
0689481K	12	2
0689483T	12	12
0689484Q	10	41
0689484Q	32	18
0689489M	40	9
0689490K	40	3
0689491L	40	4
0689492Y	18	44
0689495M	34	37
0689505J	28	8
0689509K	30	64
0689513N	28	12
0689514B	28	6
0689515F	28	9
0689516K	28	11
0689517P	24	7
0689517P	26	7
0689517P	28	13

Codice	Pag.	Rif.
0689525G	34	6
0689526L	2	28
0689526L	18	34
0689526L	28	25
0689526L	34	22
0689526L	56	20
0689526L	62	49
0689526L	66	39
0689532L	38	1
0689534D	38	15
0689535H	38	16
0689536M	38	17
0689539A	38	18
0689540G	38	20
0689541H	38	2
0689542M	38	4
0689543R	38	5
0689544E	38	6
0689545A	38	7
0689546N	38	9
0689547J	38	13
0689548F	38	22
0689549B	40	1
0689552N	40	2
0689554F	40	8
0689558G	40	10
0689562P	40	14
0689563K	40	12
0689568H	40	36
0689569D	40	37
0689571C	18	33
0689571C	40	44
0689573L	40	25
0689574H	40	
0689575D	2	12
0689575D	40	33
0689576R	40	35
0689577M	40	32
0689580L	40	26
0689583V	2	19
0689583V	40	27
0689584J	2	20
0689584J	40	28
0689585N	40	22
0689586S	40	34
0689587W	40	30
0689588K	40	23
0689591N	40	38

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Codice	Pag.	Rif.
0689592S	22	24
0689592S	32	27
0689592S	34	42
0689593W	22	30
0689593W	32	32
0689594K	22	29
0689594K	32	31
0689596T	22	28
0689596T	32	33
0689597X	32	30
0689598L	32	29
0689598L	38	8
0689608R	22	42
0689609M	10	30
0689609M	22	39
0689609M	28	3
0689616M	22	12
0689619A	10	39
0689619A	32	17
0689621H	22	11
0689621H	22	21
0689642P	42	3
0689650B	24	20
0689650B	26	20
0689654H	24	24
0689656R	24	30
0689657M	24	31
0689658A	24	37
0689659E	24	38
0689660C	24	18
0689661D	24	
0689663M	24	25
0689663M	26	25
0689665E	24	8
0689665E	26	8
0689673N	24	10
0689673N	26	10
0689675F	22	37
0689680N	22	4
0689681P	22	6
0689682T	22	5
0689683X	22	7
0689685Q	22	1
0689686U	22	10
0689698D	18	39
0689704J	10	27
0689705N	10	25
0689712N	12	26

Codice	Pag.	Rif.
0689714F	12	27
0689715B	12	28
0689733L	12	1
0689744A	12	10
0689748B	12	56
0689749F	12	46
0689752J	12	44
0689753N	12	52
0689763E	4	27
0689765G	12	40
0689766L	12	29
0689767Q	12	32
0689770F	12	38
0689771G	12	35
0689773Q	12	36
0689774D	4	19
0689794P	10	49
0689798Q	18	2
0689800F	18	6
0689801G	18	8
0689802L	18	9
0689803Q	18	
0689804D	18	12
0689805H	18	13
0689806M	18	18
0689807R	18	20
0689810U	18	16
0689810U	18	22
0689812H	18	14
0689815W	18	5
0689816A	18	4
0689831X	4	42
0689833E	4	41
0689834U	4	40
0689835Y	4	39
0689849S	8	2
0689851Z	8	5
0689857A	8	8
0689860Z	8	21
0689875U	4	55
0689893M	4	61
0689894A	6	62
0689895E	12	54
0689899F	2	3
0689900H	2	8
0689901A	2	9
0689902N	2	18
0689905B	2	14

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Codice	Pag.	Rif.
068990 8G	2	6
068990 9C	2	5
068991 5Y	32	16
068991 7G	2	23
068992 8W	32	15
068994 5T	34	48
068994 7B	34	50
068994 8Y	34	49
068995 6G	34	24
068996 0T	34	36
068996 2G	34	3
068996 3Q	34	1
068996 4Z	34	26
068996 5V	32	28
068996 6H	32	1
068996 7D	32	2
068996 8S	32	3
068996 9W	34	52
068997 0U	32	4
068997 1V	32	5
068997 2H	32	6
068997 3D	32	7
068997 4S	32	8
068997 6A	32	9
068997 7E	32	10
068998 0D	32	12
068998 2J	32	13
068998 3N	32	14
068998 4B	32	40
068998 5F	32	22
068999 3P	10	43
068999 3P	28	16
068999 3P	34	9
068999 7Q	10	46
068999 7Q	28	19
068999 7Q	34	10
068999 9H	18	43
080068 5F	42	10
080482 1T	32	
080482 2W	22	
083108 9U	64	69
083108 9U	66	60
083109 5U	52	20
083109 8Z	52	21
083176 6S	48	49
083176 6S	54	23
083176 6S	56	34
083176 6S	60	6

Codice	Pag.	Rif.
083176 6S	60	29
083179 1Y	44	14
083179 2C	44	13
083179 3G	44	10
083179 4V	44	17
083179 5Z	44	16
083179 6D	44	18
083179 7H	44	7
083179 8W	44	11
083179 9S	44	9
083180 0M	44	12
083180 1N	44	8
083180 2S	44	15
083254 9Y	50	74
083343 8S	56	45
083400 0S	48	9
083400 0S	52	9
083400 7C	48	8
083400 7C	52	8
083400 8Z	48	7
083400 8Z	52	7
083400 9V	52	6
083422 9E	50	62
083422 9E	52	19
083439 7W	54	17
083439 7W	56	38
083439 8K	50	61
083441 6U	24	22
083441 6U	26	22
083441 6U	54	18
083441 6U	56	39
083447 8K	52	5
083449 3F	52	11
083449 6C	52	18
083454 5M	50	71
083461 4Q	62	6
083461 4Q	66	46
083461 6Y	62	7
083461 6Y	66	47
083461 8R	62	8
083461 8R	66	48
083461 9M	62	9
083461 9M	66	49
083466 1Q	50	76
083466 1Q	52	2
083466 1Q	52	13
083466 2U	48	4
083466 2U	52	35

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Codice	Pag.	Rif.
0834663Y	48	2
0834663Y	52	33
0834665R	50	77
0834665R	52	3
0834665R	52	14
0835125F	50	75
0835125F	52	1
0835132C	48	3
0835132C	52	34
0835188J	52	12
0835213P	52	
0835245B	50	
0835245B	52	
0835484X	48	
0835484X	52	
0836158K	48	28
0837697G	48	6
0837698D	50	78
0838275B	48	1
0838458J	64	64
0838458J	66	55
0838659T	60	12
0838675K	50	60
0838721P	56	43
0838810G	48	30
0838811H	48	10
0838812M	48	17
0838814F	48	21
0838815A	48	22
0838816N	48	23
0838817J	44	5
0838822N	60	2
0838823J	60	1
0838824E	60	18
0838837L	48	29
0838879H	44	30
0839039R	56	41
0839041Q	56	9
0839044M	56	7
0839045R	56	42
0839075L	56	15
0839078R	56	12
0839164G	60	19
0839165C	60	27
0839167L	60	26
0839355F	56	30
0839356K	48	52
0839356K	54	12

Codice	Pag.	Rif.
0839357P	64	68
0839357P	66	59
0839358C	48	48
0839358C	56	33
0839359C	60	5
0839365G	50	55
0839609V	50	63
0839609V	52	36
0839610P	50	65
0839610P	52	38
0839611Q	50	66
0839611Q	52	39
0839612U	50	64
0839612U	52	37
0839653U	48	47
0839653U	54	11
0839653U	56	29
0839653U	60	4
0839653U	64	67
0839653U	66	58
0839701Y	50	70
0839725L	54	13
0839726Y	54	14
0839727U	54	15
0839728R	54	16
0839760N	50	67
0839831F	30	61
0839831F	56	46
0839833P	30	62
0839939B	52	17
0842105V	52	
0842150L	56	2
0842151M	56	4
0842152Z	56	
0842184V	50	69
0842211K	48	
0842213T	48	
0842214Q	44	
0842215L	44	
0842216Y	44	
0842217U	44	
0842218R	44	
0842219M	44	
0842220K	44	
0842221L	48	
1925544P	64	73
1925544P	68	73
3384420A	14	72

Codice	Pag.	Rif.
4922050Z	28	44
4922050Z	56	47
4922690G	48	26
4922770Y	28	45
4923050V	44	47
4923050V	48	42
4923050V	56	50
4923290U	48	18
4923530U	56	49
4924290R	48	33
4924290R	56	48
4924370H	44	48
4924532W	56	54
4924690Z	56	53
4925930E	30	58
4926530Z	30	59
4933567A	28	51
4933645S	28	47
4933766A	56	51
4933805X	28	56
4933926T	56	52
4934125B	28	48
4934327P	30	60
4934367K	28	46
4934405T	28	50
4934610S	28	55
4934725P	28	52
4935125F	28	49
4935285P	28	57
4935845G	28	54
4940437V	48	40
4972755V	56	13
4974076X	56	16
4991375W	56	57
4995550X	56	44
4999530V	58	68
5003395L	28	40
5003395L	44	45
5003395L	48	41
5003635L	48	39
5003635L	50	72
5006768K	44	44
5007400Y	44	46
5007400Y	48	37
5008100F	58	63
5031055S	28	42
5037500R	28	41
5037781J	48	38
5038660S	56	11

Codice	Pag.	Rif.
5042400K	56	10
5141504Y	46	50
5254216L	34	11
5313115W	18	26
5337781S	50	73
5361011M	48	12
5363150N	48	11
5363152W	48	13
5427060F	60	24
5427065A	60	24
5612447M	64	66
5612447M	66	57
5612455E	60	9
5612540D	54	10
5612540D	60	8
5612543N	48	46
5612543N	56	32
5612988H	48	45
5612988H	56	31
5613329W	56	37
5613333D	50	56
5613333D	52	4
5613333D	54	22
5613333D	56	35
5613335W	54	21
5613350W	50	57
5613350W	54	20
5613350W	56	36
5618052C	2	13
5618052C	4	18
5618052C	50	58
5618054V	50	59
5618054V	54	24
5618054V	60	13
5618054V	64	61
5618056D	60	14
5618056D	64	62
5822015Z	48	24
5822840J	56	60
5824032X	48	25
5826515T	56	61
5831671N	58	66
5835750N	28	39
5835750N	58	65
5835860A	28	37
5854215G	10	44
5854215G	24	29
5854215G	26	29

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Codice	Pag.	Rif.
5854215G	28	17
5854215G	34	11
5854216L	24	28
5854216L	26	28
5854216L	28	17
6311230Q	46	59
6311230Q	52	32
6311230Q	68	68
6311231R	46	52
6311231R	50	107
6311231R	58	69
6311231R	60	44
6311231R	64	76
6311231R	68	69
6311231R	72	42
6311234N	54	30
6311238P	24	16
6311238P	26	16
6311242W	46	49
6311242W	48	5
6311242W	54	26
6311242W	60	40
6311242W	64	87
6311242W	68	70
6311243S	60	38
6311244P	50	84
6311245K	54	28
6311245K	58	76
6311245K	60	41
6311245K	64	80
6311245K	68	86
6311247T	50	90
6311247T	64	78
6311247T	68	85
6311248Q	50	100
6311248Q	52	15
6311258R	58	80
6311282A	60	34
6312733P	50	105
6312733P	68	71
6312734C	64	81
6312734C	68	72
6312742L	40	46
6312742L	70	22
6312742L	72	38
6312743Q	64	70
6312744D	2	10
6313100F	2	32

Codice	Pag.	Rif.
6313100F	6	76
6313100F	10	56
6313100F	20	52
6313100F	30	68
6313100F	36	63
6313100F	40	15
6313100F	70	49
6313100F	72	43
6313101G	22	60
6313104D	14	69
6313111H	10	61
6313114S	16	32
6313114S	20	50
6313115W	2	39
6313115W	16	24
6313115W	22	48
6313115W	34	35
6313115W	40	54
6313115W	64	74
6313115W	68	66
6313115W	70	44
6313115W	72	41
6313116A	2	37
6313116A	6	72
6313116A	8	26
6313116A	20	56
6313116A	22	61
6313116A	34	18
6313117E	2	40
6313117E	14	78
6313117E	16	21
6313117E	16	30
6313117E	34	16
6313117E	34	32
6313119X	8	28
6313119X	20	59
6313120V	16	33
6313120V	64	86
6313120V	68	65
6313121W	68	64
6313122A	68	63
6313125X	68	62
6313125X	72	44
6313130W	28	33
6313131X	2	34
6313131X	6	81
6313132B	14	73
6313132B	50	93

Codice	Pag.	Rif.
6313132B	52	40
6313140X	42	19
6313147H	42	15
6313148W	2	30
6313148W	10	57
6313148W	18	3
6313148W	22	46
6313148W	24	42
6313148W	26	41
6313148W	28	30
6313148W	32	41
6313148W	38	23
6313148W	40	47
6313148W	64	82
6313148W	68	67
6313167B	42	12
6313175U	42	17
6313710G	10	60
6313710G	20	51
6313710G	70	48
6313710G	72	45
6314101V	70	21
6314101V	72	47
6314116X	62	46
6314116X	68	78
6316101D	12	31
6316111S	6	73
6320606P	4	28
6321103H	16	34
6321103H	32	43
6321103H	40	49
6321103H	46	58
6321103H	46	62
6321103H	50	103
6321103H	52	44
6321103H	54	33
6321103H	64	72
6321104W	6	71
6321104W	14	66
6321104W	18	27
6321104W	56	17
6321104W	58	79
6321104W	60	43
6321104W	64	79
6321104W	68	76
6321104W	72	48
6321105S	50	96
6321105S	52	30

Codice	Pag.	Rif.
6321105F	56	1
6321108X	42	14
6321108X	60	36
6321206G	2	41
6321206G	10	51
6331103A	46	60
6331103A	54	31
6331103A	58	74
6331103A	64	71
6331104X	22	62
6331104X	40	53
6331104X	54	27
6331104X	58	77
6331104X	60	42
6331104X	64	77
6331104X	68	74
6331104X	70	45
6331105T	46	57
6331105T	50	94
6331105T	52	41
6331105T	58	81
6331106F	64	83
6331106E	68	77
6332103H	46	61
6332103N	50	106
6332103N	54	32
6332103N	58	75
6332103N	60	37
6332103N	70	8
6332103N	72	39
6332104B	46	54
6332104B	58	78
6332104B	64	75
6332104B	68	75
6332104B	70	46
6332104B	72	40
6332105F	50	95
6332105F	52	42
6332105F	58	82
6332105F	64	60
6332105F	68	79
6332108C	42	18
6332108C	60	35
6332303J	22	53
6332303J	50	104
6332303J	52	27
6332304F	56	18
6332304F	60	39

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Codice	Pag.	Rif.
6337106Q	4	60
6337107L	2	21
6337107L	12	8
6337107L	22	9
6337107L	32	23
6337107L	40	29
6337107L	62	27
6337109D	2	29
6337109D	4	54
6337109D	10	53
6337109D	16	7
6337109D	22	15
6337109D	32	20
6337111Y	12	47
6337111Y	16	8
6337111Y	24	39
6337111Y	26	39
6337111Y	34	7
6337112C	4	22
6337112C	16	10
6337114V	4	35
6337114V	12	45
6337114V	62	37
6337114V	68	87
6337116D	4	36
6337116D	10	18
6337116D	62	10
6337116D	66	50
6337129T	64	58
6337406W	12	25
6337513Q	8	9
6337513Q	18	11
6337516M	4	6
6337516M	10	5
6337516M	12	19
6337516M	22	27
6337516N	34	41
6337516M	38	10
6337522M	10	28
6337522M	22	41
6337522M	28	5
6341133S	6	64
6341133S	38	24
6341162Z	2	17
6341162Z	40	20
6341732A	16	35
6342139Y	34	4
6342139Y	64	57

Codice	Pag.	Rif.
6342521D	6	65
6351106H	12	42
6351114N	20	47
6351114N	22	47
6351114N	38	21
6351115T	4	53
6351115J	14	75
6352024A	22	8
6371310N	62	55
6441206U	8	4
6441206U	18	10
6441208M	4	34
6441208M	10	24
6441208M	12	18
6441208M	22	17
6441208M	34	40
6441208M	38	3
6478500M	62	34
7454710F	58	71
7459202J	58	70
7465510G	64	88
7465510G	68	84
9431035Y	46	56
9431035Y	70	32
9431035Y	72	18
9602125H	12	33
9920107T	10	47
9920107T	28	20
9920107T	34	13
9920215X	30	65
9920216N	2	35
9920216N	20	54
9920216N	34	15
9920301N	24	12
9920301N	26	12
9920302S	6	74
9920302S	20	60
9920303W	20	55
9920303W	24	13
9920303W	26	13
9920303W	30	66
9920303W	34	20
9920305L	28	10
9920306T	26	42
9920307X	22	50
9920307X	24	41
9920307X	26	40
9920307X	28	31

Codice	Pag.	Rif.
9920308L	14	70
9920308L	24	11
9920308L	26	11
9920308H	40	51
9920315A	6	78
9920315A	20	49
9920401Y	2	36
9920402C	22	44
9920402C	46	53
9920403G	14	76
9920404V	8	27
9920404V	10	58
9920404Y	14	77
9920408L	22	49
9921301P	6	77
9921301P	20	48
9921302T	20	58
9921303X	30	67
9923302B	34	46
9923401H	42	7
9925301Q	6	75
9925321E	6	84
9925321E	26	26
9925335G	24	26
9926216U	40	17
9933281S	16	19
9933281S	34	30
9936261M	32	24
9936352S	32	26
9936352S	34	54
9936352S	40	21
9938305P	22	52
9938406C	14	71
9940224M	14	63
9940250E	18	24
9940303Y	6	80
9940303Y	10	55
9940303Y	20	53
9940303Y	32	44
9940303Y	34	14
9940303Y	40	48
9940307S	28	26
9940313Y	30	69
9940324B	28	32
9940326T	22	51
9940402E	8	29
9940402E	14	68
9940402E	18	7

Codice	Pag.	Rif.
9940404X	14	67
9940405T	8	17
9940405T	12	23
9940406F	18	25
9940406F	34	19
9940432V	2	38
9940432V	20	57
9940432U	34	17
9940441J	16	23
9940441J	16	31
9940441J	34	34
9940502G	6	66
9940502G	40	52
9940520R	14	74
9940613T	6	82
9940618R	2	31
9940618R	8	30
9940618R	10	54
9940618R	22	45
9940618R	30	63
9940618R	32	42
9940618R	40	50
9940618R	42	16
9940673Z	8	32
9940802X	10	59
9940821H	42	13
9944421N	16	22
9944421N	34	33
9945221E	16	13
9945221E	34	25
9949416X	14	64
9960106T	32	25
9960181J	12	55
9961117M	40	16
9962143T	4	49
9962154R	12	51
9963163Z	4	51
9963164N	16	12
9963164N	34	53
9963165J	16	11
9963183B	2	25
9963183B	12	50